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STATISTICAL RETRIEVAL OF TEMPERATURES FROM SCR-B, AT 10 TO 0.4 MB

by

D. Hovland and R. Wilcox

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Final Report

Contract F49620-78-C-0036

with

Air Force Office of Scientific Research

Washington, D.C.

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(Block 20 continued) cont. at the bordering levels. Details of the procedure, which included extensive prior preparation of the radiances, are given here. Global temperatures at 10, 5, 2, 1 and 0.4 mb along the orbit, and the mean temperatures (thicknesses) between the levels, are now ready to apply to the next phase of this study, which will obtain heights of those surfaces at latitude-longitude gridpoints. The planetary waves will be computed from these gridpoint values.

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ABSTRACT

The purpose of this first phase of a study on the morphology of planetary waves was to estimate global temperatures for the upper stratosphere and lower mesosphere from the radiances of the SCR-B experiment on Nimbus 5. This has been successfully achieved using a regression of the radiances on meteorological rocket data. In general, the accuracy of the retrieved temperatures, i.e. standard deviation of the error, varies from about $3^{\circ}K$ at 10 mb to about $5.5^{\circ}K$ at 0.4 mb as compared to meteorological rocket values. Layer mean temperatures are about one-half degree more accurate than temperatures at the bordering levels. Details of the procedure, which included extensive prior preparation of the radiances, are given here. Global temperatures at 10, 5, 2, 1 and 0.4 mb along the orbit, and the mean temperatures (thicknesses) between the levels, are now ready to apply to the next phase of this study, which will obtain heights of those surfaces at latitude-longitude gridpoints. The planetary waves will be computed from these gridpoint values.

Table of Contents

I. INTRODUCTION

The past several years have seen a tremendous surge of interest in the upper atmospheric regions above 10 mb. Better knowledge of the dynamics and thermodynamics of these regions is now seen to be essential to improved understanding of, for example, ozone photochemistry and flux, the morphology of stratospheric planetary waves and warmings, and possible links between upper and lower atmospheric phenomena. In particular, temperature perturbations in the region may be useful precursors of perturbations in the troposphere, i.e. weather anomalies.

One of the first requirements of such research is a daily data set which is much more complete in spatial coverage than any previously available data set. The purpose of this first phase of the study was to provide global temperatures above 10 mb from the SCR-B radiometer on Nimbus 5 for 1973-1974. In view of the experience and improvements gained in processing SCR-B, the SCR-A data, from Nimbus 4, 1970-1972, have been processed in the same manner so that the entire data set is consistent. A description of the processing used in both sets is included here for convenient reference. Together, the SCR-A and SCR-B data now provide a nearly 5-year data set from which many studies can be made.

II. SELECTIVE CHOPPER RADIOMETER DATA

A. The SCR Instrument

From April 1970 through December 1974, two instruments, SCR-A and SCR-B, were flown on NASA's polar-orbiting satellites, Nimbus 4 and Nimbus 5, respectively. The SCR (Selective Chopper Radiometer) instruments, which are described fully in References 1 and 2, were designed, in part, to sense radiation upwelling from regions 10 mb to 0.4 mb. The weighting functions for both instruments are shown in Figure 1; the radiances which are available for determining temperature in the regions above 10 mb are from Channels A and B in SCR-A, and Channels B12, B23, B34, and B4 in SCR-B. These radiances have been "cleaned" carefully, regressed with coincident rocketsonde data, and used to produce a 56-month time series of sub-orbital temperatures at 10, 5, 2, 1, and .4 mb and mean temperatures (thicknesses) in the layers between those levels.

B. Data Sources

Most of the SCR-A and SCR-B data tapes were received from the National Space Science Data Center (NSSDC). These were copies of tapes supplied to NSSDC by the Oxford experimenters. The 48 SCR-A tapes covered the period 27 July 1970 to 30 January 1973. The period 11 April 1970 to 27 July 1970 was covered by a set of radiance tapes available only at CDC. These data were calibrated at CDC some time ago from the SCR-A raw radiances extracted from a set of 800 Sensory Data Tapes supplied by NASA. The 63 SCR-B tapes covered the period 13 December 1972 to 26 December 1974. Formats of the NSSDC-supplied tapes are given in References 3 and 4. The two sets of data tapes were organized similarly, but the details of the formats were quite different as the instruments themselves were quite different.

C. SCR-B Radiances

Examples of the calibrated radiances from the SCR-B data tapes are shown in Figures 2 and 3. The two orbits plotted are nearly complete from the Northern Hemisphere (NH) descending into the Southern Hemisphere (SH) and then ascending into the NH again. The data were consistent enough from point to point so that it was necessary to plot only every fifth point. The radiances from the B-difference channels (B13, B23, B34) were previously smoothed by the Oxford experimenters. They used a five-point running mean and applied it to the orbital data four times. Details of the calibration processing are given in Reference 2.

D. SCR-A Radiances

Figures 4 and 5 show radiances from the two highest channels of SCR-A at every point along one orbit in December 1971. The most striking feature of the SCR-A radiances is the high frequency noise, particularly on Channel A. These radiances were not smoothed during the calibration processing at Oxford as the SCR-B radiances were. Channel A and Channel B were therefore smoothed here with the filter which is discussed later.

III. DATA EXTRACTION AND SORT

Preliminary processing of the SCR data from the two satellites was done separately, with two sets of programs. The input data tape formats were different primarily because SCR-B had more and different channels than SCR-A. In addition, the SCR-A radiances had to be filtered along the orbits. However, most of the techniques described below were used on both SCR-A and SCR-B data.

A. Extracting and First Sort

The calibrated radiances were just a small part of the data on the tapes received from NSSDC. The tapes also contained identification words, engineering data concerning the state of the instrument and the satellite, calibration parameters, and data from other experiments. The data extracted and saved on a new set of tapes included orbit number, day, time, latitude, longitude, radiances, and 24 flag bits. Some of the problems encountered included sometimes unreliable orbit number, day number, or time. In some cases, the latitude and/or longitude were obviously incorrect. Sometimes certain identification records were either missing or duplicated, making it difficult to distinguish ends of orbits and ends of days. The biggest problem was the data being out of order. Before the data could be filtered they had to be arranged chronologically. The first re-sort was done by copying the extract tapes and re-ordering individual orbits or whole days that were obviously out of order.

B. Merge CDC Calibrated Radiances for SCR-A

A list of the data missing from the re-sorted SCR-A tapes was compared with an inventory of the data that had been sorted and calibrated at CDC. The data available at CDC for filling in gaps in the NSSDC data included every other day for the first three months of SCR-A and several days scattered through the first year. The new data were written on another tape in the same format as the data extracted from the NSSDC tapes, with a flag to denote the source (NSSDC or CDC). In addition, the CDC-calibrated data had to be adjusted to reflect some changes in the calibration procedure which were discovered after the original calibration had been completed. The extracted data from the two sources were then merged by copying to a new set of tapes. This step also took care of a few orbits that had been missed in the previous re-sort.

C. Final Sort

The final sorting technique was designed to handle out-of-order and duplicate data within orbits. It also handled one or two orbits near midnight GMT that were almost always out of order and that were not re-sorted previously. For each 24-hour period a 5400 word array was generated. There was one slot in the array for each 16-second satellite observation interval, called a major frame. If the time corresponding to the first slot is known, the times of all slots are known since each one is 16 seconds after the one before. The array was positioned to cover the period from 12Z one day to 12Z the following day. Since the out-of-order orbits near 00Z were then near the center of the array, it was not necessary to switch back and forth between arrays for different days.

The 5400 words were first cleared to zero which represents "missing". Words corresponding to major frames without good data remain zero. Each major frame was then examined to determine if there were data worth keeping. A major frame was rejected if any of the radiances were missing, or if the time or position was obviously bad (e.g. hour was greater than 23, or latitude was greater than 80°N, or longitude was greater than 360°E). The following parameters were saved from a good SCR-A major frame: latitude, longitude, Channel A radiance, Channel B radiance, and a flag to distinguish the source. The SCR-B parameters saved were latitude, longitude and radiances for Channels B12, B23, B34, and B4. The position of the major frame in the 5400 word array was determined from the time, and the parameters were stored in the appropriate word. When a new day was encountered, the 5400 word array was written to tape and the process was repeated for the new day. The generated tapes were very compact, having two year's data per reel.

IV. ERROR CHECKING AND FILTERING

A. SCR-B Error Checking

The SCR-B data were examined to identify and remove erroneous values. Latitudes and longitudes for approximately ten orbits in the two-year period were found to be incorrect. These incorrect locations were identified by comparing the ascending and descending nodes (equator crossings) in the data with nodes computed independently based on the regularity of the Nimbus-5 orbits. No attempt was made to correct the erroneous locations as the amount of data was small.

The data series, which were normally quite smooth, had occasional random spikes, which were identified and removed by another screening technique. Minima and maxima of all radiances in 10^{o} latitude belts were computed for each day. It was found that extremes for each latitude belt are very consistent from day to day except when spikes in the data caused an unusual minimum or maximum. By examining the time series of minima and maxima it was possible to specify a range of allowable radiances for each channel for each day and latitude belt. Any radiances outside the allowable ranges were removed. This technique typically removed fewer than five points per day.

B. SCR-A Error Checking

The same error checking procedures just described for SCR-B were also applied to SCR-A. A greater amount of data was determined to be bad than was found for SCR-B. Seventeen orbits were removed because of bad locations. The technique of specifying ranges of allowable radiances also worked for SCR-A, even though the data were much noisier.

C. SCR-A Filtering

Following this error screening, it was still necessary to filter the SCR-A data to remove the noise described in Section II-C. Since Channels A and B were to be used together, the same filter was used for both channels, although A (Figure 4) was obviously more noisy than B (Figure 5). Figure 6 shows Channel A radiances from part of one orbit before and after filtering. A simple running mean removed much of the random noise evident in the unfiltered data. It was decided to use a five-point running mean, applied four times, to be consistent with the smoothing done at Oxford on the SCR-B data. As mentioned in the Oxford documentation, this is essentially a Gaussian filter with a half-width of about seven points (major frames). The chosen filter is shown as the heaviest line in Figure 7. Figure 8 shows how effective this 17-point filter is in removing the noise in Channel A radiances. The three short segments shown are from the orbit plotted in Figure 4.

Before the SCR-B data were smoothed by Oxford, short gaps were filled by linear interpolation. Tests were made to determine the effects this interpolation would have on the SCR-A data. Five points in the center of each data segment of Figure 8 were removed and replaced by linear interpolation. The results after filtering the interpolated segments are shown by the dots in Figure 9. The crosses show the results after filling the gaps with the filter instead of by linear interpolation, i.e. a missing point was filled by the weighted average of the nearby non-missing points. The solid curves are the filtered results from Figure 8 plotted with a twice expanded ordinate. The filtered values at the interpolated points are quite different from the filtered values when the points are not missing. Also, four points on either side of the gaps are strongly affected. The filtered values for the gap and four points on each side are quite different from the original smoothed data.

For the above reasons, when the SCR-A data series was actually filtered, gaps were not interpolated because of the possibility of introducing large errors. Data near gaps must be used cautiously because of possible errors propagating from the gaps. Rather than throwing out the data neighboring the gaps during the filtering process, a flag was added to the data for each major frame. This flag showed the number of points (up to 17) and the sum of the filter weights corresponding to the non-missing points under the filter. The filtered output was also written as a 5400 word array for each 24 hour period. A few data points were removed because both Channel A and Channel B were not present.

SCR-A data after 17 April 1972 were filtered separately because, on that date, Channels C and D were lost. Channel C had been used in the calibration of Channels A and B before that data, and, with Channel C gone, the character of the calibrated radiances for Channels A and B changed abruptly.

V. REGRESSIONS

After the radiances had been sorted chronologically and filtered, meteorological parameters such as temperatures and thicknesses could be derived from them. The most reliable way to determine temperatures and thicknesses from radiances is by regression, as described in Reference 5. Regression coefficients were based upon a coincident set of meteorological rocket network (MRN) and SCR data. The 13 MRN stations used, primarily from the NH, are described in Table 1.

Rocket soundings were taken about once a week at each station, but not usually when the satellite was passing over the station; therefore, the number of coincident observations was quite small. The sample size was increased by forming a time series of all available satellite radiances at each of the rocket stations, as discussed in the next section. From the time series at a given station, radiance values were interpolated in time to coincide exactly with the times of the rocket firings. These space/time "coincident" data provided the data set for the regressions.

A. Time Series Generation

Nimbus 4 and Nimbus 5 were local noon/local midnight satellites. Any point on Earth, 80°N to 80°S, had one or more nearby daytime overpasses and one or more nearby nighttime overpasses. As an example, Figure 10 shows the orbits (with data) passing near Ft. Churchill in three consecutive 24-hour periods. A data set was created which contained all the data available within "boxes", of size six degrees latitude by 60 degrees longitude, centered on each of 16 rocket stations. (These 16 included the 13 of Table 1 plus 3 SH stations, which had little rocket data and were used only to check the time consistency of SCR data). From this SCR time series it was possible to interpolate, for each rocket station and for each day, a "daytime" radiance from the ascending orbits and "nighttime" radiance from the descending orbits, as follows. When two orbits surround the station, a station value was interpolated from each orbit's average within the box. When only one orbit was available, the orbit box average was used. For each radiance channel, separate time series were obtained from daytime and nighttime conditions at each rocket location; four separate time series were therefore obtained for SCR-A, and eight for SCR-B.

The time series of the daytime and nighttime radiances were plotted, along with meteorological parameters from the actual rocket observations. These time plots were very useful in identifying the many short periods of bad data, especially for SCR-A. New procedures were then devised to re-clean the data (these have been discussed in Section IV). Several rocket data were also identified as erroneous, and were eliminated from further consideration.

In our previous work with SCR-A data, we found that large differences sometimes existed between the daytime and nighttime radiances at a given place, particularly in Channel B. These differences were larger than one would expect from diurnal atmospheric changes, and were known to change with season and latitude. To remove this effect, monthly zonal means of the diurnal differences for all channels of both SCR-A and SCR-B were computed. Then, interpolating in latitude and in time, we applied these differences to each ascending datum, effectively making each radiance a nighttime radiance.

B. Regression

The time series discussed in the last section were interpolated, in time, to the times of rocket firings. The interpolation was linear, and the maximum time separation of SCR data (for the purpose of interpolation to a rocket time between them) was 42 hours, with one exception: If the gap was larger than 42 hours, SCR data from an endpoint of the gap was assigned to the rocket time if the rocket-SCR time difference was less than 6 hours.

In order to develop consistent regression models, it was necessary to combine the rocket data into 3 sets which represented latitude regions near 60N, 30N and 10N, termed "high", "mid", and "low" (Table 1). Further, the station groups were partitioned into warm and cold "seasons" of generally six months, which were chosen to take into account real atmospheric changes while allowing for changing instrument characteristics. One of the seasonal partitions was chosen as 17 April 1972, corresponding with the SCR-A calibration change mentioned earlier.

Several functions, X, of the SCR radiances were correlated with each desired atmospheric parameter. These SCR functions included the radiances, their squares, square roots, and fourth roots, as well as the products and the ratios of the radiances.

In the regression development a standard screening procedure was used. First, for each atmospheric parameter (predictand), the most highly correlated function, X_1, was identified and the percent of predictand variance which it explained was calculated. Then the effect of X_1 was removed from all the other correlations and the next most highly correlated function, X_2, was identified and its contribution to additional reduction of predictand variance was calculated. The procedure was continued for a third and fourth function but it was found, for both SCR-A and SCR-B, that additional functions never led to a significant improvement over a two-function model. The model was therefore restricted to two functions, X_1 and X_2.

The form of the model used was

$$\hat{P} = \bar{P} + A_1 \cdot (X_1 - \bar{X}_1) + A_2 \cdot (X_2 - \bar{X}_2) \tag{1}$$

where $\hat{P}$ is the predictand

$\bar{P}$ is the mean value of the predictand

A_i is the coefficient of the i'th predictor, $X_i - \bar{X}_i$, and

$\bar{X}_i$ is the mean value of the i'th function.

The coefficients A were calculated from:

$$A_1 = \frac{\sigma(P)}{\sigma(X_1)} \cdot \frac{r(P,X_1)^2 - r(P,X_2) \cdot r(X_1,X_2)}{1 - r(X_1,X_2)^2}$$

$$A_2 = \frac{\sigma(P)}{\sigma(X_2)} \cdot \frac{r(P,X_2)^2 - r(P,X_1) \cdot r(X_1,X_2)}{1 - r(X_1,X_2)^2}$$

where σ denotes standard deviation and r denotes correlation coefficient.

Such models were generated for each predictand, for each latitude region and season. One problem was that two functions which explained the most variance of a particular predictand were not generally the same between latitude regions or seasons. However, in almost all cases, nearly as much variance could be explained by functions which were judiciously specified so that they varied smoothly in latitude and season. By varying smoothly is meant that one of the functions X must be the same for adjacent latitude regions in the same season or at adjacent seasons in the same latitude region. (Due to the change in character of the SCR-A radiances after 17 April 1972, smoothness in this time transition was not required). Although by specifying the model some theoretically explainable variance was lost, this method was preferred because it insured smoother derived meteorological parameters across time and latitude boundaries. Very little degradation of results for individual seasons or latitude regions was caused by the adoption of this restriction. In the two cases where the penalty for imposing smoothness was judged too high, the restriction was not enforced.

It should be noted that the secondary screening procedure was redone when the specified X_1 differed from the truly most highly correlated function.

In this way the optimum choice for X_2 was assured.

Appendix A contains details of the models. The first group of entries for each level/latitude/season (i.e. "Run 1") shows the functions used, predictor coefficients, and the percent variance explained by the model. (See p. A-2 for complete details of entries. Also, note that the results for layer mean temperatures may be viewed in terms of thickness by noting that $1^{o}K \approx 21$, 27, 21, and 27 m in the 10-5, 5-2, 2-1, and 1-.4 mb layers, respectively.)

Also listed in Appendix A are results of tests of the model which were performed on independent data in the following manner: For each predictand/latitude-region/season, a model (using the specified functions) was developed from only 85 percent of the available rocket-SCR pairs. This model was then used to compute the predictands for the remaining 15 percent of the radiances, which were then compared with the coincident rocket parameters. The mean error and the standard deviation of the error are given for five such tests, each of which used a different, randomly-chosen, 85 percent/15 percent combination of dependent/independent data. It is seen that neither the variance explained nor the coefficients vary greatly as a function of dependent data set, and that the standard deviation of the error of the predictions is usually far less than the standard deviation of the dependent (rocket) data.

These independent data tests were also useful in determining whether the prescribed X_1 and X_2 were actually as good as their "percent variance explained" advertised them to be. Often, a model which was slightly inferior in terms of percentage variance explained, but which was more consistent with respect to its neighbors (in latitude and season), could be shown to be of equivalent quality when applied to independent data. In these cases the more consistent model was the one finally used.

Averaging of the standard deviations of the errors of the five independent data tests yields the following accuracies: At 10 and 5 mb, the error is about $3^{o}K$, generally increasing upward to about $5.5^{o}K$ at .4 mb. The error of the layer mean temperatures is generally about one-half degree less than the errors at the bordering levels.

As NMC 10 mb temperature is available north of 20°N, it was realized it should be a good predictor of 10-5 mb mean temperature and other parameters as well. However, since it was not always available, and never for the tropics and SH, use of NMC data was first excluded from the regression. Later it was felt better to utilize whatever data did exist to optimize the regression, even if for only north of 20°N. A new set of models was developed, then, using NMC 10 mb temperature as a possible predictor.

However, it seems that NMC and MRN 10 mb temperatures are not always well correlated, and after investigation it was decided to use MRN as the standard. Appendix B shows details of the performance of the regressions when and where NMC 10 mb temperature is a useful predictor; at other levels and seasons, Appendix A results are preferable. This shows that the prediction of temperatures at 10 mb and in the 10-5 mb layer are improved by about one-fourth degree due to use of NMC 10 mb temperatures. It is believed that the accuracies presented in Appendices A and B are quite good, especially considering the errors present in the data before cleaning.

VI. APPLICATION TO SCR-B ORBITAL DATA

The models discussed in the last section were used to calculate atmospheric parameters from SCR-B orbital data. A full set of atmospheric parameters was computed for every major frame having data, with the data first being corrected for zonal monthly mean diurnal radiance differences, as explained in Section V-A. Several decisions were required concerning smoothing, use of 10 mb (NMC) data, and Southern Hemisphere processing, and these are outlined below.

A. Smoothing

It was desirable to insure smooth transitions of computed atmospheric parameters across time and latitude boundaries. The time boundaries are shown in Appendix A; the latitude boundaries in the NH were chosen to be 22.5°N and 42.5°N (SH processing is discussed later). Smoothness in latitude was accomplished by 1) computing the parameter using both sets of statistics within a ±2½ degree "window" of the boundary, and 2) forming an appropriately weighted averaged, based on location relative to the boundary. Smoothing across time boundaries followed the same procedure, with the "window" being ±4 days.

B. Use of 10 mb (NMC) Data

Temperature and height at 10 mb on the 1977-point NMC grid were available, and, when required, 10 mb temperature was used as a predictor of parameters north of 20N. To 10 mb height can be added the layer thicknesses to determine heights of 5, 2, 1, and 0.4 mb. Since the NMC grid was only available once a day (12Z), 10 mb fields had to be (linearly) interpolated in time, as well as space, to the sub-satellite points. The maximum gap over which interpolation was allowed was 48 hours (1 missing day); for longer gaps the regression models not using 10 mb fields were used.

C. Southern Hemisphere Processing

No extratropical SH rocket stations had enough observations to allow stable regressions with SCR data. It was therefore necessary to apply, in the SH mid-latitudes (22.5°S to 42.5°S) and high latitudes (poleward of 42.5°S), models based on NH regressions in the appropriate time of year (i.e. winter or summer half-years). Of the four NH regression periods, only the middle two (16 April - 15 October 1973 and 16 October 1973 - 15 April 1974) were used for this purpose.

In the SH tropics, the same regression model was used as was used in the NH tropics. No 6-month time shift was applied, since the amplitude of the annual wave in temperature is small (less than 2°K from 10 mb to 1 mb and less than 4°K at .4 mb) in the tropics (Reference 7).

Procedures to assure smoothness over the time and latitude boundaries were the same for the SH as for the NH.

VII. RESULTS

The SCR-B radiances have been used to estimate the temperature at 10, 5, 2, 1, and 0.4 mb and the mean temperature and thickness of the layers between these surfaces, along the orbit, for the Northern and Southern Hemispheres.

In the next phase of this work, the heights of the same surfaces at latitude-longitude grid points will be computed for use in obtaining planetary waves, for the five-year period of record of SCR-A and SCR-B. This will require careful space-and-time-interpolation of all the data.

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Table 1

Rocketsonde Stations Used for Regressions with SCR-A and SCR-B

Latitude Grouping	Station No.	Station Name	Latitude	Longitude
	04202	Thule	76.6N	68.8W
	70266	Ft. Greely	64.0	145.7
High	70192	Poker Flats	65.0	147.5
	72913	Ft. Churchill	58.7	93.8
	72124	Primrose Lake	54.8	110.1
	72402	Wallops Is.	37.8	75.5
	72391	Pt. Mugu	34.1	119.1
Mid	72269	White Sands	32.4	106.5
	74794	Cape Canaveral	28.5	80.5
	91162	Barking Sands	22.0	159.8
	78861	Antigua	17.2	61.8
	78783	Ft. Sherman	9.3	80.0
Low	78801	Ft. Sherman		
	91366	Kwajalein	8.7	167.7E
	61902	Ascension	8.0S	14.4W

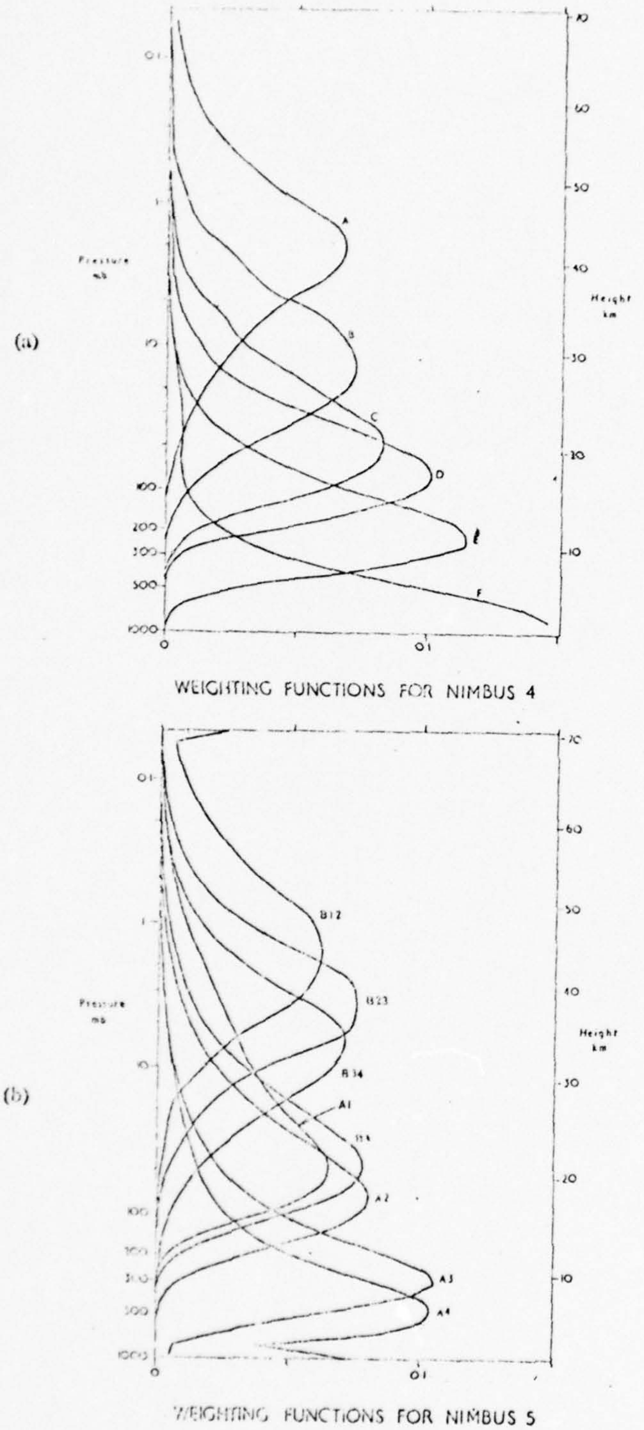


Figure 1. Weighting functions for (a) the Nimbus 4 SCR and (b) the Nimbus 5 SCR. (From reference 6).

Figure 2. Corrected radiances from Nimbus 5 readout orbit 2732 (2 July 1973).

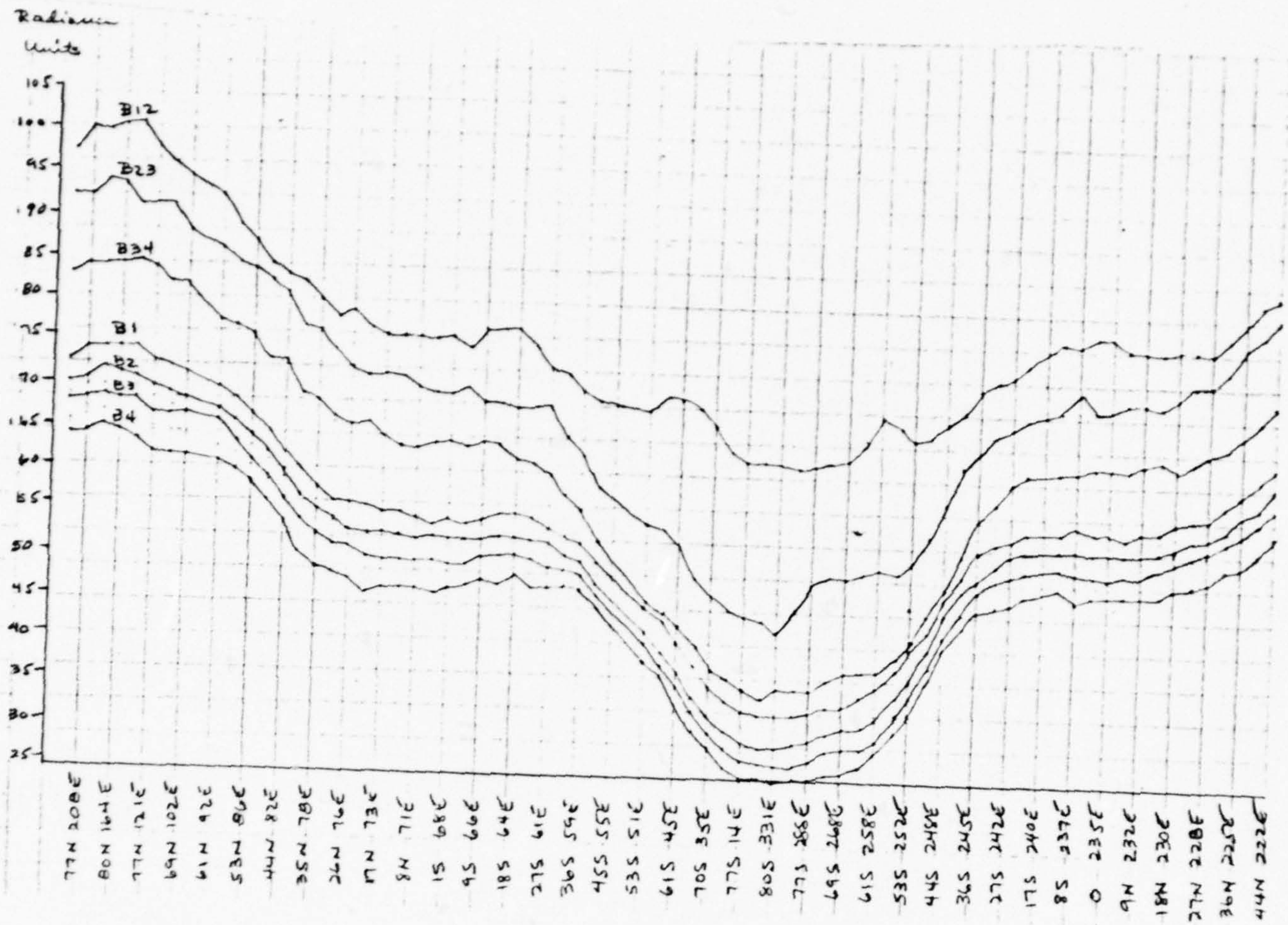


Figure 3. Corrected radiances from Nimbus 5 readout orbit 5303 (10 January 1974).

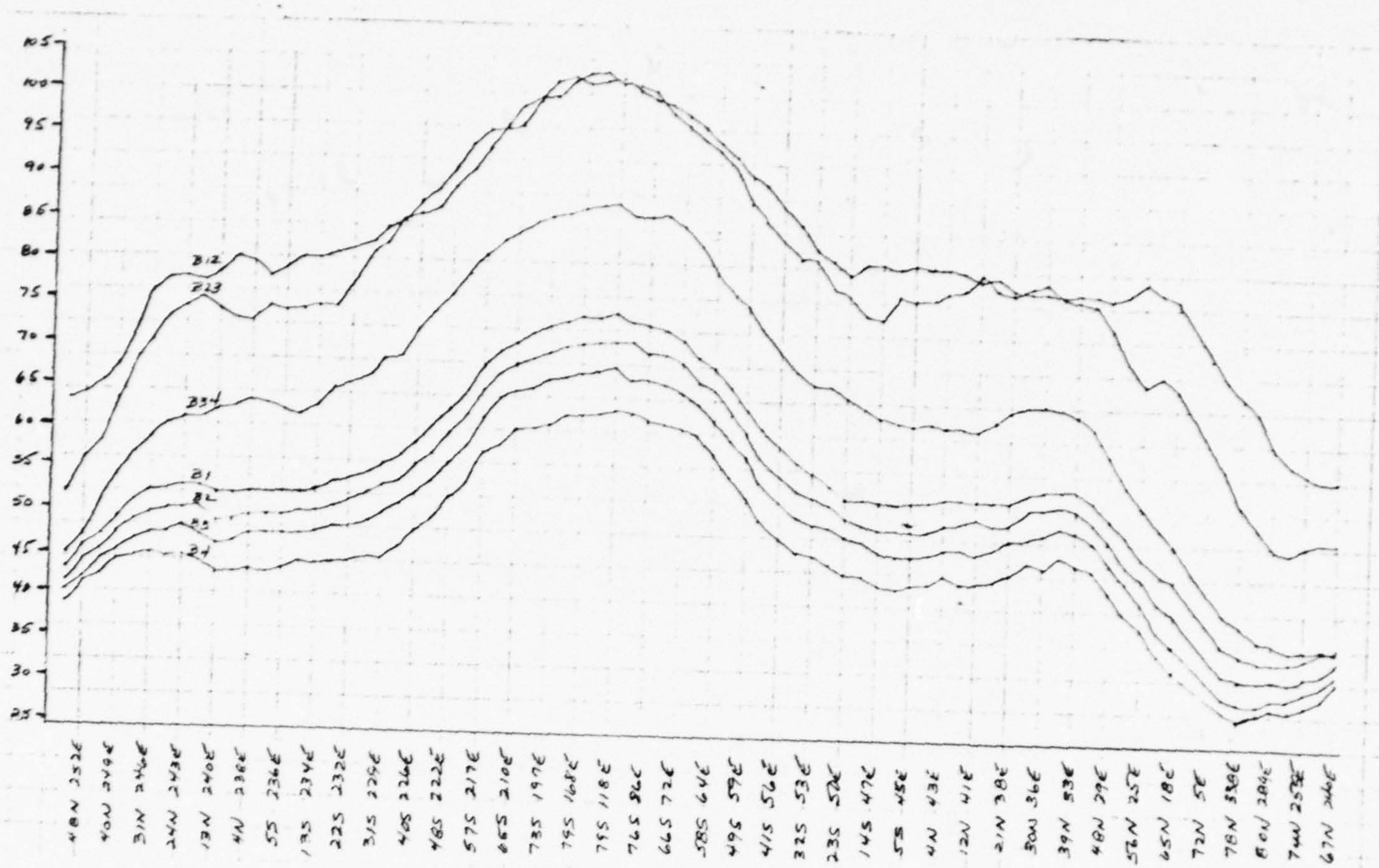
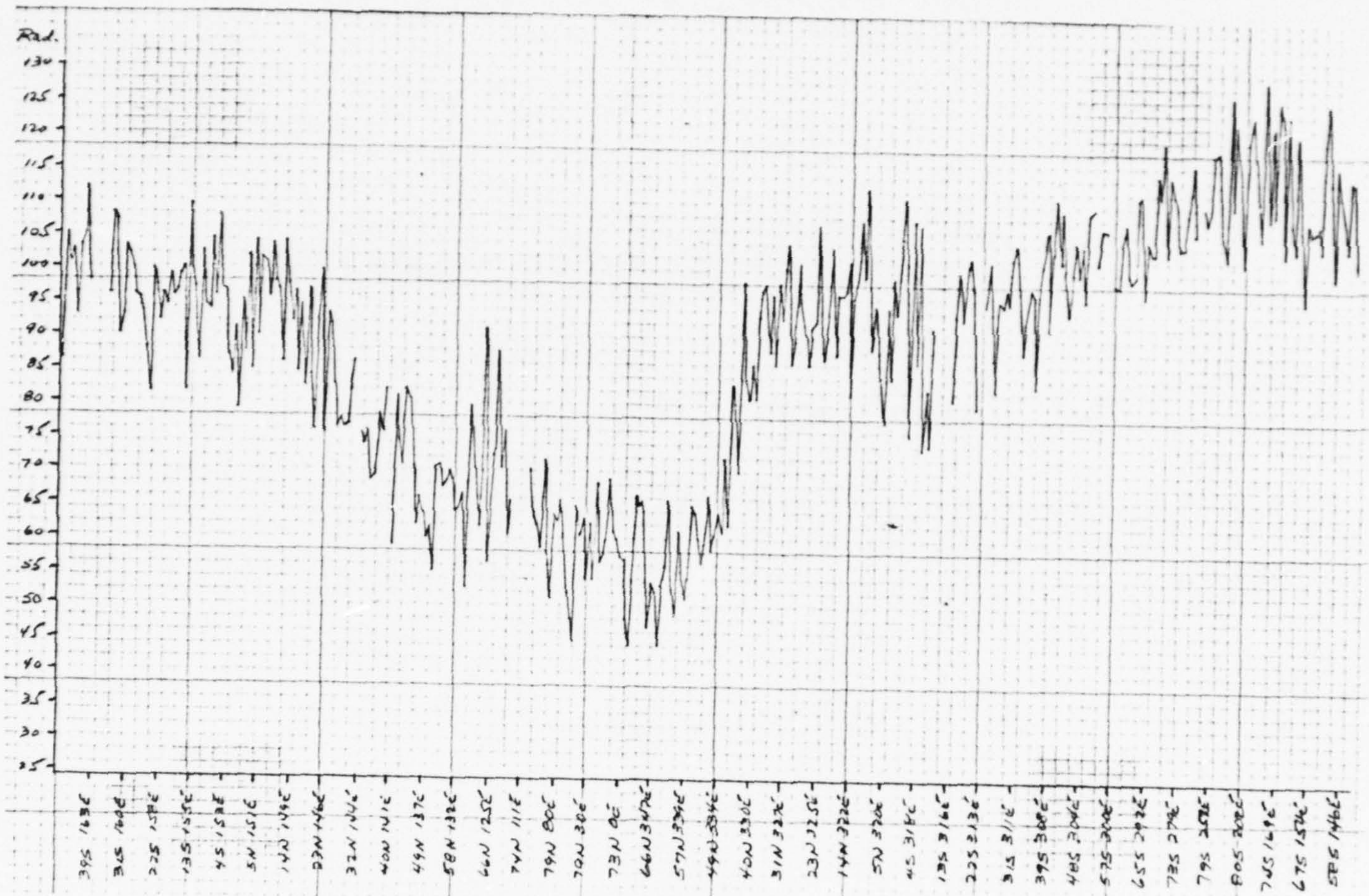


Figure 4. Imbalance corrected channel A radiances from Nimbus 4 readout orbit 8189 (9 December 1971).



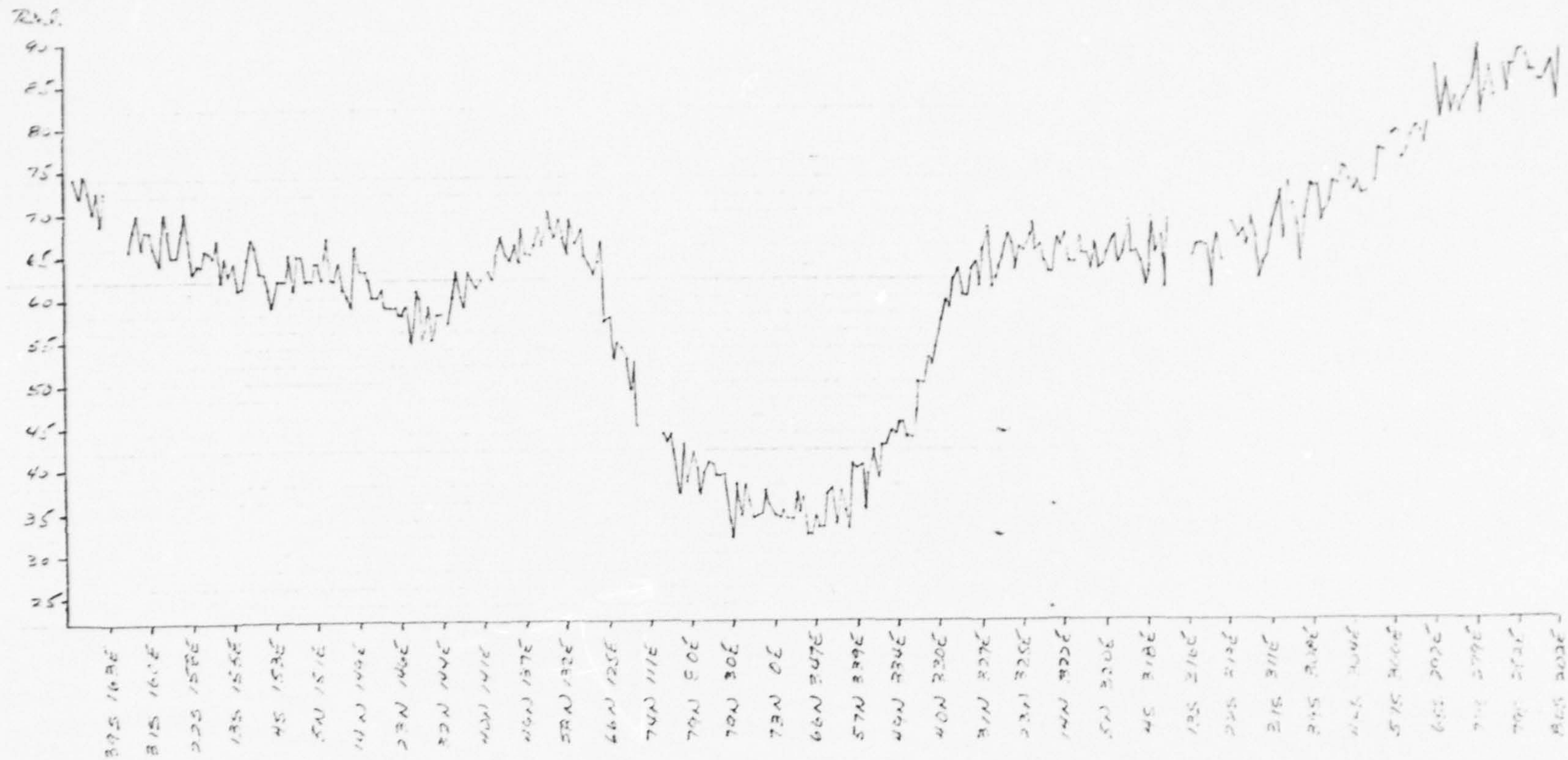
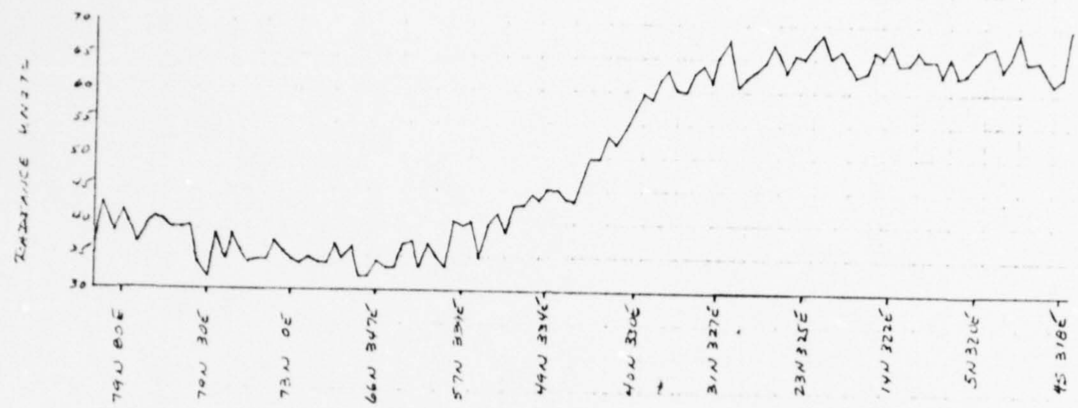


Figure 5. Imbalance corrected channel B radiances from Nimbus 4 readout orbit 8189 (9 December 1971).

Figure 6. (a) Imbalance corrected channel A radiances from part of Nimbus 4 readout orbit 1479.



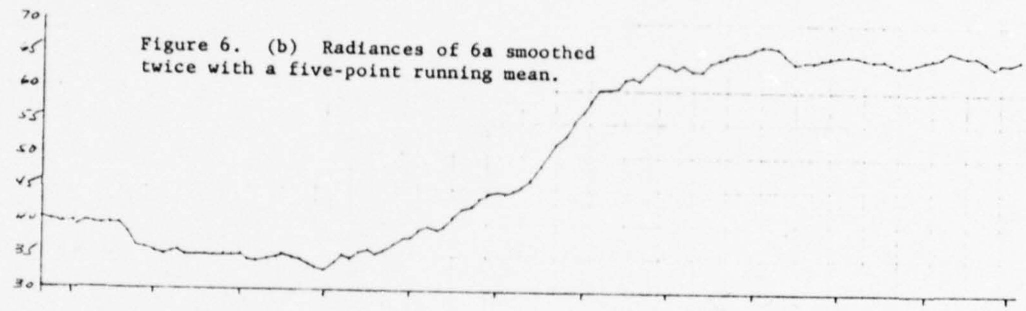


Figure 6. (b) Radiances of 6a smoothed twice with a five-point running mean.

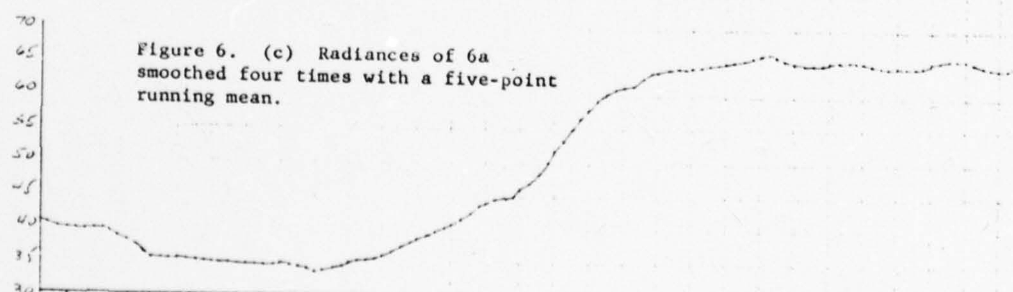
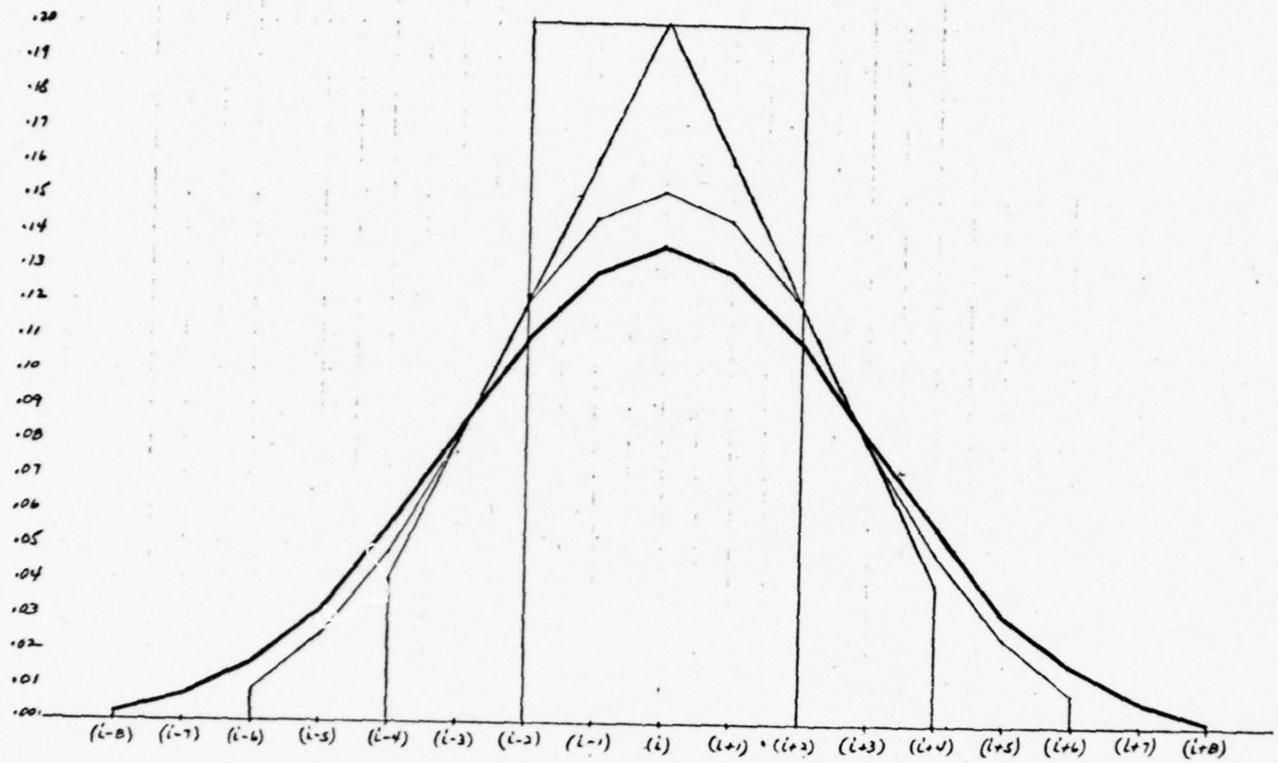


Figure 6. (c) Radiances of 6a smoothed four times with a five-point running mean.

Figure 7. Weights for a five-point running mean filter applied one, two, three and four times.



÷5							1	1	1	1	1						
÷25					1	2	3	4	5	4	3	2	1				
÷125			1	3	6	10	15	18	19	18	15	10	6	3	1		
÷625	1	4	10	20	35	57	68	80	85	80	68	52	35	20	10	4	1

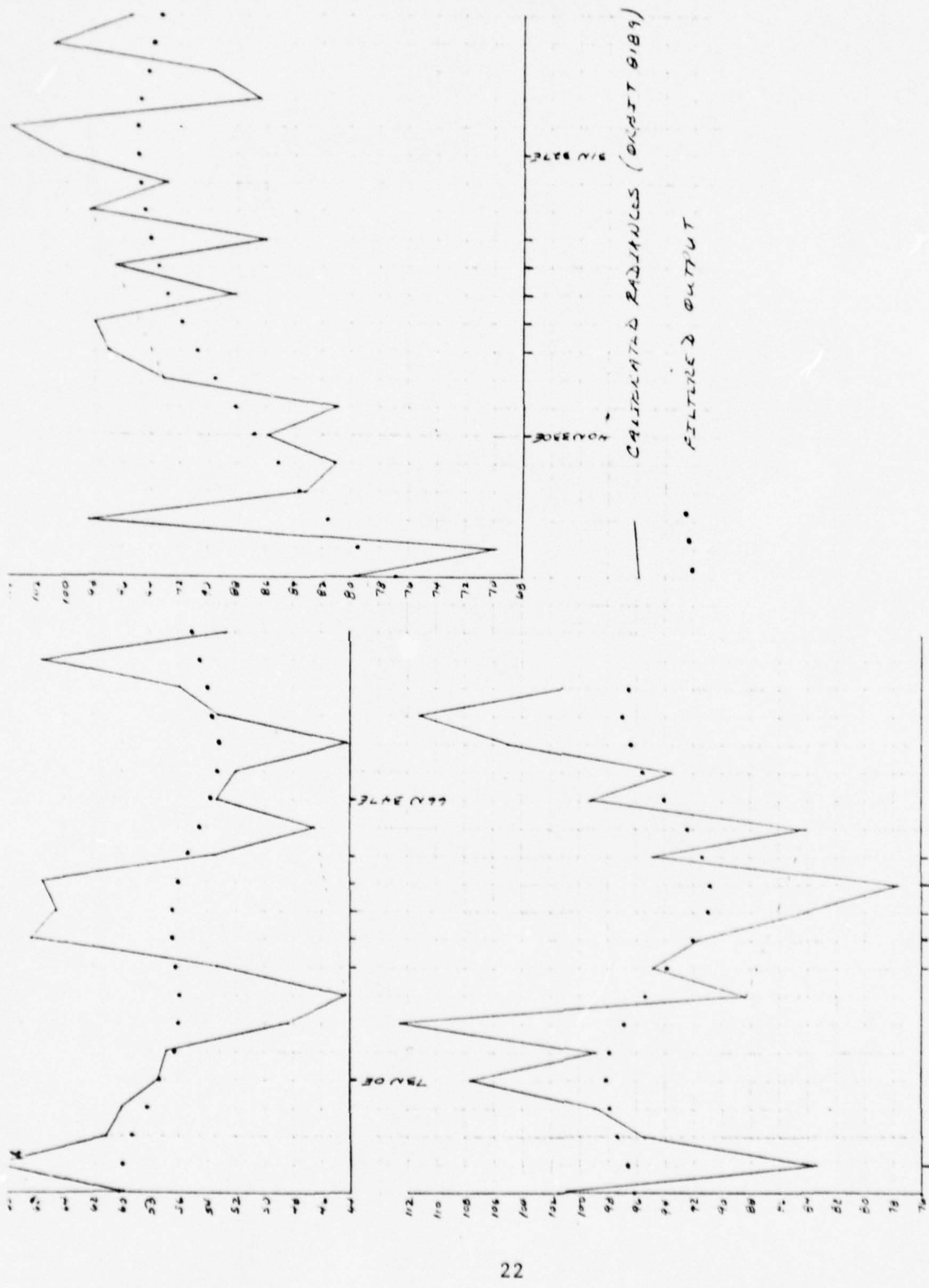


Figure 8. Examples of filtering.

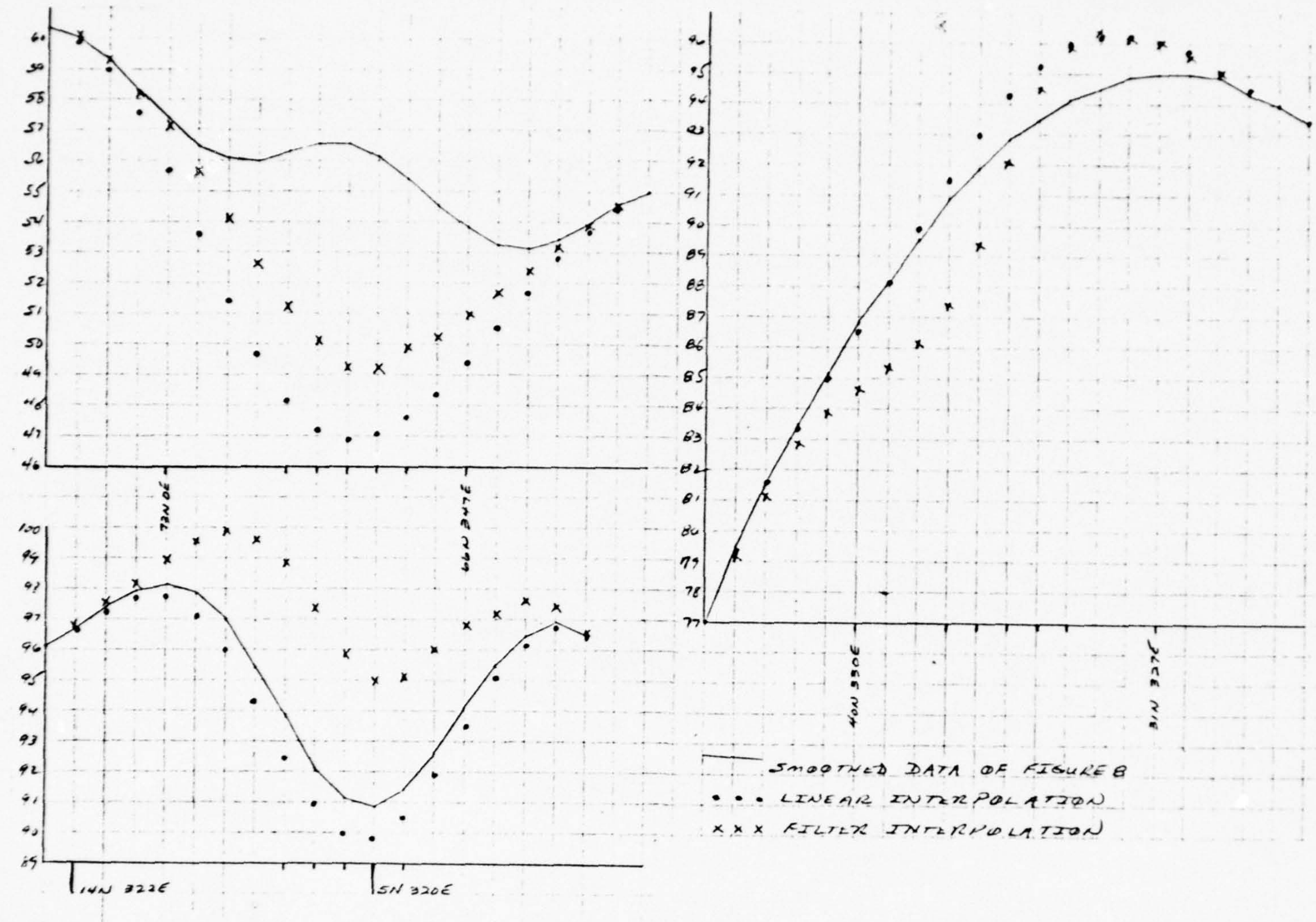


Figure 9. Examples of interpolation.

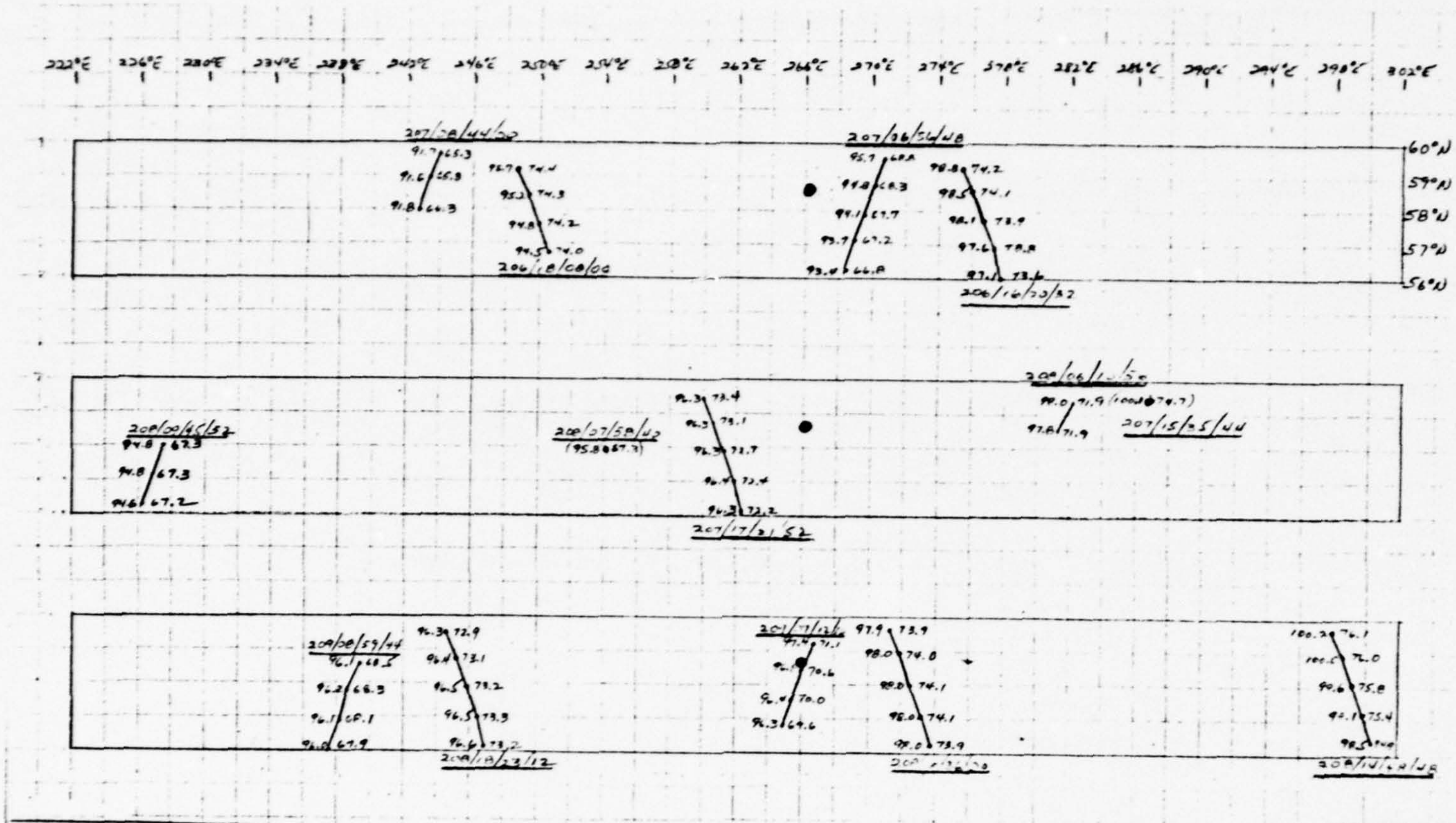


Figure 10. Nimbus 4 orbits near Ft. Churchill (large dot) for days 207, 208, and 209, 1970. Times are GMT. (206/18/08/00 means Day 206, 18^h 08^m 00^s). Numbers to the left of the tracks are filtered SCR-A Channel A, to the right are Channel B.

APPENDICES

A. Statistical accuracy of temperature retrievals from SCR-B radiances at meteorological rocket network locations, not using 10 mb NMC temperatures. These show the regressions used for the regions south of 20^{o}N.

B. Same as A, for those atmospheric parameters, latitudes, levels, and periods for which 10 mb temperatures improved the retrievals, i.e. where "2" is indicated as a predictor. These regressions were used north of 20^{o}N.

EXPLANATORY NOTES FOR APPENDICES A AND B

Accuracy of Temperature Retrievals from SCR-B Radiances at MRN Locations

1. Regression models for temperature and mean temperatures, developed using all available rocket data, are shown in run 1. These models were then tested as follows:

   a. For each station group and period, a randomly chosen 15 percent of the available MRN observations were set aside to serve as an independent test set, and the remaining 85 percent were used to develop a regression model.

   b. This regression model was applied to the radiances occuring at the other 15 percent of the MRN locations and times, with a resulting mean error and standard deviation of the error as shown in the listing.

   c. Steps a and b were repeated for four more, different, sets of random data. These five verification tests are shown under runs 2 - 6.

2. Explanation of printout tables:

A	B	D	F	I
	C	E	G	J
			H	K

A = Run number
B = Primary predictor (see 3 below) used in the model
C = Secondary predictor used in the model
D = Variance explained by a model which uses only the primary predictor
E = Variance explained by the full, 2 - predictor model
F = Mean of the rocket data used in the model, $\overline{P}$ (see eq. (1) in text)
G = Coefficient of the primary predictor, A_1
H = Coefficient of the secondary predictor, A_2
I = Number of observations (run 1), number of independent cases tested (runs 2 - 6)
J = Mean error of the independent cases (^oK). Applies only to runs 2 - 6
K = Standard deviation (^oK) of all the rocket data (for run 1); standard deviation (^oK) of the error for the independent test cases (for runs 2 - 6)

3. Explanation of predictors. (Note: R_1 = ch B12 radiance, R_2 = ch B23, R_3 = ch B34, R_4 = ch B4.)

2 = NMC 10 mb temp	6 = $R_1^{1/4}$	10 = $R_1 \cdot R_2$
3 = $R_3 \cdot R_4$	7 = $R_2^{1/4}$	11 = $R_1 \cdot R_3$
4 = R_1/R_3	8 = $R_3^{1/4}$	12 = $R_1 \cdot R_4$
5 = R_1/R_4	9 = $R_4^{1/4}$	13 = $R_2 \cdot R_3$

4. Station groups on each page are for high (60^o-75^oN), middle (30^o-40^oN), and low (10^oS-20^oN) latitudes, arranged from top to bottom. From left to right, are 6-month periods (year/day). Temperatures for 5 levels are shown first, followed by 4 mean-layer-temperatures.

10.0 MB TEMPERATURE

STATIONS 04202 70192 72913 74124 (HIGH LATITUDES)

PERIOD	72/347 - 73/115				73/116 - 73/288				73/289 - 74/115				74/116 - 74/360			
RUN																
1	9	76.	219.7	83	3	88.	234.7	123	3	86.	223.3	105	3	90.	229.6	181
	3	77.	.691E+2	0.0	8	89.	.440E-2	0.0	4	89.	.915E-2	0.0	4	92.	.786E-2	0.0
			.327E-2	8.3			.349E+2	6.9			-.212E+2	10.6			-.220E+2	9.7
2	9	74.	219.9	17	3	88.	235.0	18	3	86.	222.8	16	3	90.	229.8	33
	3	74.	.724E+2	-.4	8	89.	.338E-2	1.0	4	89.	.842E-2	1.0	4	93.	.779E-2	.3
			.260E-2	2.9			.439E+2	2.4			-.237E+2	3.9			-.246E+2	3.0
3	9	76.	219.6	16	3	87.	234.4	19	3	86.	223.2	18	3	90.	229.3	27
	3	77.	.724E+2	-.3	8	88.	.294E-2	1.1	4	89.	.917E-2	-.1	4	93.	.787E-2	-.5
			.233E-2	4.3			.465E+2	1.7			-.208E+2	3.2			-.257E+2	2.5
4	9	76.	219.5	11	3	88.	234.7	15	3	86.	223.0	13	3	90.	230.0	25
	3	78.	.638E+2	1.1	8	89.	.455E-2	.1	4	89.	.916E-2	-.5	4	93.	.780E-2	-1.0
			.398E-2	4.6			.335E+2	2.1			-.226E+2	2.7			-.221E+2	2.2
5	9	84.	219.3	6	3	91.	234.4	11	3	86.	223.7	12	3	90.	229.5	16
	3	85.	.801E+2	.5	8	91.	.743E-2	-.9	4	88.	.908E-2	-1.0	4	92.	.793E-2	.0
			.258E-2	9.9			.126E+2	3.9			-.213E+2	3.0			-.209E+2	2.5
6	9	76.	219.4	10	3	88.	234.5	20	3	88.	223.1	18	3	89.	229.2	37
	3	76.	.748E+2	1.5	8	89.	.337E-2	.1	4	89.	.903E-2	.8	4	91.	.798E-2	-.7
			.194E-2	4.4			.413E+2	2.2			-.173E+2	2.9			-.169E+2	2.5

STATIONS 72402 72391 72269 74794 (MID LATITUDES)

PERIOD	72/347 - 73/115				73/116 - 73/288				73/289 - 74/115				74/116 - 74/360			
RUN																
1	3	58.	230.0	160	8	38.	234.4	248	3	38.	229.4	300	3	66.	230.8	309
	4	73.	.882E-2	0.0	3	38.	.893E+2	0.0	4	41.	.777E-2	0.0	4	72.	.918E-2	0.0
			-.652E+2	7.9			-.233E-2	3.2			-.182E+2	4.0			-.345E+2	4.8
2	3	58.	229.9	24	8	34.	234.6	45	3	41.	229.4	54	3	69.	230.7	46
	4	72.	.860E-2	.3	3	34.	.908E+2	-.1	4	45.	.789E-2	-.2	4	74.	.950E-2	.8
			-.665E+2	3.3			-.307E-2	1.9			-.177E+2	3.6			-.333E+2	3.2
3	3	58.	230.4	22	8	37.	234.4	37	3	33.	229.4	43	3	67.	230.7	49
	4	72.	.882E-2	.1	3	37.	.589E+2	-.2	4	34.	.765E-2	-.4	4	72.	.924E-2	.4
			-.656E+2	4.0			.173E-2	2.3			-.134E+2	3.3			-.335E+2	2.5
4	3	57.	229.8	24	8	35.	234.6	36	3	44.	229.2	52	3	66.	230.8	44
	4	73.	.885E-2	.5	3	36.	.102E+3	-.9	4	47.	.843E-2	1.3	4	71.	.935E-2	-.6
			-.670E+2	3.7			-.458E-2	1.9			-.167E+2	3.6			-.321E+2	2.1
5	3	58.	230.3	18	8	41.	234.5	28	3	38.	229.4	37	3	67.	230.7	35
	4	74.	.800E-2	-.8	3	41.	.871E+2	-.5	4	43.	.720E-2	.5	4	73.	.907E-2	.2
			-.690E+2	4.9			-.181E-2	3.2			-.216E+2	3.7			-.374E+2	2.7
6	3	55.	230.0	28	8	40.	234.3	47	3	39.	229.4	46	3	65.	230.8	46
	4	71.	.834E-2	.0	3	40.	.727E+2	.4	4	43.	.784E-2	-.4	4	71.	.885E-2	-.4
			-.670E+2	3.2			-.493E-3	3.1			-.190E+2	3.1			-.350E+2	2.1

STATIONS 91162 78861 78801 91366 61902 (LOW LATITUDES)

PERIOD	72/347 - 73/115				73/116 - 73/288				73/289 - 74/115				74/116 - 74/360			
RUN																
1	3	54.	232.7	118	8	36.	233.4	168	3	32.	233.0	219	3	19.	233.3	217
	8	55.	.167E-1	0.0	3	38.	.586E+2	0.0	4	33.	.111E-1	0.0	4	20.	.774E-2	0.0
			-.371E+2	4.3			.783E-2	3.1			-.147E+2	3.5			-.254E+2	3.5
2	3	51.	232.4	21	8	36.	233.3	30	3	31.	232.9	36	3	19.	233.3	39
	8	52.	.180E-1	-.0	3	39.	.471E+2	.5	4	33.	.100E-1	.1	4	20.	.738E-2	-.3
			-.511E+2	3.0			.935E-2	2.7			-.192E+2	3.2			-.225E+2	3.6
3	3	55.	232.6	17	8	38.	233.3	29	3	34.	233.1	37	3	17.	233.3	35
	8	55.	.154E-1	.5	3	41.	.494E+2	.4	4	34.	.120E-1	-.8	4	19.	.719E-2	-.3
			-.267E+2	3.1			.965E-2	3.0			-.129E+2	2.7			-.297E+2	2.5
4	3	55.	232.4	17	8	36.	233.5	25	3	33.	232.9	34	3	17.	233.3	30
	8	57.	.196E-1	-.1	3	38.	.559E+2	-.2	4	35.	.106E-1	.8	4	19.	.777E-2	-.4
			-.561E+2	3.6			.813E-2	2.1			-.169E+2	3.4			-.236E+2	2.5
5	3	55.	232.8	9	8	32.	233.4	19	3	34.	233.0	20	3	18.	233.2	22
	8	56.	.173E-1	-.7	3	35.	.518E+2	-.0	4	35.	.111E-1	-.1	4	20.	.687E-2	-.2
			-.385E+2	2.8			.888E-2	1.9			-.187E+2	3.2			-.333E+2	2.6
6	3	51.	232.8	13	8	34.	233.4	29	3	30.	233.1	39	3	21.	233.2	32
	8	51.	.165E-1	.8	3	36.	.596E+2	-.4	4	31.	.103E-1	-.6	4	22.	.829E-2	.3
			-.380E+2	2.1			.742E-2	2.5			-.178E+2	3.1			-.233E+2	3.4

5.0 MB TEMPERATURE

STATIONS 04202 70192 72913 74124 (HIGH LATITUDES)

PERIOD	72/347 - 73/115				73/116 - 73/288				73/289 - 74/115				74/116 - 74/360			
RUN																
1	8	76.	227.4	86	8	92.	246.4	122	8	90.	227.5	122	8	96.	237.5	183
	12	77.	.783E+2	0.0	5	94.	.804E+2	0.0	12	93.	.144E+3	0.0	5	97.	.869E+2	0.0
			.173E-2	9.7			.158E+2	8.8			-.102E-1	11.7			.574E+1	14.8
2	8	74.	227.6	17	8	91.	247.0	18	8	90.	227.1	17	8	96.	236.0	33
	12	75.	.718E+2	-.4	5	92.	.820E+2	.0	12	93.	.138E+3	.4	5	97.	.875E+2	.6
			.253E-2	3.6			.156E+2	2.1			-.945E-2	3.0			.918E+1	2.9
3	8	74.	227.7	16	8	91.	246.2	19	8	90.	227.4	19	8	96.	237.3	28
	12	75.	.657E+2	.0	5	92.	.749E+2	1.1	12	93.	.141E+3	-.3	5	96.	.902E+2	-.3
			.301E-2	4.6			.154E+2	1.5			-.946E-2	2.7			.330E+1	2.6
4	8	78.	227.7	12	8	93.	246.2	15	8	90.	227.5	15	8	96.	238.0	26
	12	78.	.822E+2	-.8	5	95.	.789E+2	1.4	12	93.	.144E+3	-.3	5	96.	.910E+2	-.9
			.113E-2	5.1			.163E+2	3.3			-.101E-1	3.2			.987E+0	2.8
5	8	81.	226.9	6	8	93.	246.2	10	8	90.	227.7	12	8	96.	237.4	16
	12	81.	.956E+2	-.9	5	94.	.814E+2	-.6	12	93.	.147E+3	-.7	5	96.	.921E+2	-.0
			-.600E-3	9.5			.152E+2	2.9			-.106E-1	2.7			.133E+1	2.4
6	8	77.	226.9	10	8	92.	246.2	20	8	91.	227.5	20	8	96.	236.9	37
	12	78.	.747E+2	1.5	5	93.	.782E+2	.1	12	94.	.140E+3	-.7	5	96.	.889E+2	-.1
			.194E-2	6.2			.175E+2	2.0			-.937E-2	2.9			.592E+1	2.8

STATIONS 72402 72391 72269 74794 (MID LATITUDES)

PERIOD	72/347 - 73/115				73/116 - 73/288				73/289 - 74/115				74/116 - 74/360			
RUN																
1	8	66.	242.9	168	8	50.	244.7	265	8	51.	237.9	312	8	51.	242.2	317
	12	69.	.178E+3	0.0	7	51.	.806E+2	0.0	12	54.	.153E+3	0.0	12	52.	.121E+3	0.0
			-.101E-1	8.4			.297E+2	4.1			-.930E-2	6.2			-.491E-2	5.4
2	8	66.	242.7	25	8	51.	244.8	51	8	53.	237.5	57	8	52.	242.4	46
	12	69.	.180E+3	-.2	7	52.	.805E+2	.7	12	56.	.141E+3	.9	12	53.	.124E+3	-.3
			-.990E-2	4.0			.319E+2	2.6			-.800E-2	5.3			-.493E-2	4.4
3	8	67.	243.2	23	8	47.	244.7	40	8	49.	237.9	45	8	51.	242.3	50
	12	70.	.174E+3	-.3	7	48.	.851E+2	-.7	12	52.	.151E+3	-.6	12	52.	.124E+3	.1
			-.969E-2	5.2			.234E+2	1.8			-.890E-2	4.3			-.526E-2	3.8
4	8	65.	243.0	25	8	49.	244.8	40	8	56.	237.7	55	8	51.	242.1	45
	12	68.	.179E+3	.1	7	51.	.745E+2	-.5	12	61.	.143E+3	.5	12	52.	.120E+3	-.0
			-.101E-1	4.1			.371E+2	2.5			-.114E-1	5.9			-.477E-2	3.9
5	8	65.	243.3	19	8	49.	244.7	28	8	53.	237.8	38	8	53.	242.1	36
	12	69.	.186E+3	-.8	7	50.	.852E+2	.6	12	56.	.152E+3	.7	12	53.	.113E+3	1.8
			-.120E-1	4.8			.256E+2	2.3			-.919E-2	6.0			-.352E-2	3.6
6	8	65.	243.1	28	8	48.	244.7	49	8	51.	237.8	46	8	50.	242.3	48
	12	69.	.185E+3	-.9	7	49.	.784E+2	-.4	12	54.	.141E+3	.1	12	51.	.121E+3	-.5
			-.113E-1	3.6			.291E+2	2.4			-.796E-2	4.9			-.495E-2	3.6

STATIONS 91162 78861 78801 91366 61902 (LOW LATITUDES)

PERIOD	72/347 - 73/115				73/116 - 73/288				73/289 - 74/115				74/116 - 74/360			
RUN																
1	8	47.	244.1	120	8	19.	245.3	176	8	29.	244.2	225	8	15.	244.4	230
	12	48.	.130E+3	0.0	5	26.	.851E+2	0.0	12	30.	.170E+3	0.0	12	19.	.121E+3	0.0
			-.468E-2	5.0			.224E+2	4.2			-.780E-2	5.8			-.900E-2	4.0
2	8	53.	243.9	21	8	16.	245.3	32	8	30.	243.9	36	8	16.	244.2	38
	12	54.	.131E+3	-.4	5	23.	.769E+2	.0	12	32.	.186E+3	1.5	12	18.	.115E+3	.7
			-.448E-2	5.0			.219E+2	3.9			-.111E-1	5.0			-.767E-2	3.0
3	8	51.	244.1	17	8	22.	245.4	30	8	30.	244.4	39	8	12.	244.3	39
	12	51.	.108E+3	.6	5	28.	.918E+2	-.0	12	32.	.182E+3	-1.1	12	15.	.110E+3	.1
			-.766E-3	3.8			.209E+2	4.1			-.937E-2	4.9			-.938E-2	3.8
4	8	42.	243.7	17	8	20.	245.2	27	8	31.	244.1	33	8	15.	244.3	30
	12	42.	.114E+3	.9	5	26.	.837E+2	.3	12	32.	.149E+3	1.2	12	19.	.125E+3	.3
			-.346E-2	2.9			.208E+2	4.0			-.810E-2	6.1			-.961E-2	2.9
5	8	44.	244.2	9	8	18.	245.4	20	8	31.	244.4	22	8	15.	244.3	23
	12	45.	.131E+3	.4	5	22.	.870E+2	-1.1	12	32.	.189E+3	-1.2	12	18.	.107E+3	.3
			-.500E-2	2.0			.174E+2	3.8			-.725E-2	6.4			-.741E-2	4.5
6	8	45.	244.1	13	8	18.	245.4	31	8	28.	244.3	41	8	15.	244.5	36
	12	46.	.141E+3	2.2	5	26.	.843E+2	-.9	12	29.	.144E+3	-.3	12	19.	.119E+3	-.9
			-.643E-2	3.5			.228E+2	3.8			-.645E-2	5.0			-.955E-2	4.4

2.0 MB TEMPERATURE

STATIONS 04202 70192 72913 74124 (HIGH LATITUDES)

RUN	PERIOD 72/347 - 73/115				73/116 - 73/208				73/209 - 74/115				74/116 - 74/360			
1	10	81.	244.2	83	8	91.	266.1	121	10	86.	240.1	125	6	96.	252.5	184
	5	81.	.968E-2	0.0	5	94.	.949E+2	0.0	5	87.	.104E-1	0.0	10	96.	.115E+3	0.0
			.505E+1	14.7			.275E+2	11.2			.344E+1	12.3			.986E-3	19.8
2	10	79.	244.6	15	8	89.	266.9	18	10	86.	240.0	17	6	96.	253.3	33
	5	80.	.952E-2	-1.2	5	92.	.953E+2	-.5	5	87.	.106E-1	-.6	10	96.	.120E+3	.6
			.526E+1	4.2			.256E+2	3.1			.529E+1	3.7			.712E-3	3.4
3	10	79.	245.3	14	8	89.	265.8	19	10	87.	240.2	20	6	96.	252.2	28
	5	79.	.978E-2	-1.0	5	92.	.942E+2	1.1	5	88.	.104E-1	2.2	10	96.	.110E+3	-1.2
			.300E+1	4.9			.269E+2	2.0			.358E+1	3.9			.129E-2	4.3
4	10	80.	244.6	12	8	91.	266.0	15	10	87.	240.2	16	6	96.	253.0	27
	5	81.	.929E-2	-.5	5	95.	.909E+2	.2	5	88.	.107E-1	-1.6	10	96.	.119E+3	.1
			.686E+1	5.8			.295E+2	4.2			.465E+1	5.4			.562E-3	4.1
5	10	87.	243.8	6	8	91.	265.7	10	10	86.	240.4	13	6	96.	252.2	17
	5	87.	.957E-2	.8	5	94.	.961E+2	.4	5	86.	.104E-1	.1	10	96.	.110E+3	1.1
			.523E+1	15.0			.267E+2	4.2			.408E+1	3.6			.143E-2	3.0
6	10	81.	243.6	10	8	90.	265.7	19	10	86.	240.4	20	6	96.	252.3	37
	5	81.	.100E-1	1.6	5	94.	.932E+2	.5	5	87.	.103E-1	-.5	10	96.	.109E+3	-1.4
			.397E+1	7.2			.291E+2	2.4			.377E+1	3.9			.152E-2	3.3

STATIONS 72402 72391 72269 74794 (MID LATITUDES)

RUN	PERIOD 72/347 - 73/115				73/116 - 73/208				73/209 - 74/115				74/116 - 74/360			
1	10	44.	261.4	176	10	39.	263.1	270	10	58.	258.0	312	10	64.	260.4	326
	5	54.	.547E-2	0.0	12	41.	.142E-2	0.0	5	63.	.692E-2	0.0	12	65.	.850E-2	0.0
			.254E+2	7.9			.108E-1	5.1			.219E+2	7.6			.203E-2	7.5
2	10	39.	261.3	26	10	36.	263.3	51	10	59.	257.9	57	10	62.	260.8	48
	5	50.	.518E-2	.1	12	38.	.887E-3	.3	5	64.	.683E-2	.1	12	62.	.855E-2	-1.9
			.247E+2	4.5			.115E-1	2.9			.226E+2	5.2			.781E-3	5.4
3	10	46.	261.6	26	10	38.	263.1	40	10	57.	258.2	45	10	66.	260.4	51
	5	53.	.600E-2	-.8	12	41.	.179E-3	-.6	5	63.	.612E-2	-.4	12	66.	.976E-2	.0
			.225E+2	5.3			.136E-1	2.7			.249E+2	5.1			.341E-3	4.5
4	10	44.	261.7	26	10	40.	263.4	42	10	59.	257.9	53	10	64.	260.2	45
	5	54.	.558E-2	-.4	12	41.	.324E-2	-1.0	5	65.	.693E-2	-.1	12	65.	.796E-2	.1
			.264E+2	4.3			.739E-2	3.8			.231E+2	5.2			.348E-2	3.7
5	10	38.	261.7	19	10	39.	263.1	30	10	59.	258.0	38	10	66.	260.4	38
	5	48.	.497E-2	.1	12	42.	.723E-3	.4	5	63.	.731E-2	.3	12	67.	.690E-2	.7
			.235E+2	5.3			.121E-1	4.3			.201E+2	5.2			.502E-2	5.9
6	10	45.	261.3	29	10	42.	263.0	49	10	59.	258.1	46	10	65.	260.5	50
	5	55.	.560E-2	2.0	12	45.	.561E-3	.3	5	64.	.708E-2	.4	12	65.	.907E-2	-.4
			.263E+2	3.4			.128E-1	4.8			.229E+2	4.2			.105E-2	4.7

STATIONS 91162 78861 78801 91366 61902 (LOW LATITUDES)

RUN	PERIOD 72/347 - 73/115				73/116 - 73/208				73/209 - 74/115				74/116 - 74/360			
1	10	56.	263.1	118	10	32.	263.4	172	10	32.	264.5	222	10	23.	262.6	226
	12	57.	.904E-2	0.0	12	34.	.106E-1	0.0	12	32.	.840E-2	0.0	12	25.	.109E-1	0.0
			-.431E-2	5.4			-.769E-2	4.3			-.234E-2	4.6			-.643E-2	4.3
2	10	56.	262.6	19	10	33.	263.3	32	10	32.	264.4	35	10	19.	262.6	37
	12	57.	.995E-2	.5	12	36.	.113E-1	.7	12	32.	.101E-1	.0	12	21.	.102E-1	.4
			-.657E-2	3.7			-.885E-2	3.7			-.485E-2	2.9			-.610E-2	3.2
3	10	56.	263.1	17	10	32.	263.6	29	10	32.	264.5	38	10	22.	262.7	39
	12	57.	.971E-2	1.9	12	34.	.103E-1	-.4	12	33.	.717E-2	-.3	12	23.	.103E-1	-.6
			-.522E-2	3.3			-.726E-2	3.5			.163E-2	4.7			-.557E-2	3.5
4	10	55.	263.0	17	10	32.	263.3	26	10	32.	264.3	33	10	23.	262.6	30
	12	56.	.843E-2	-.6	12	33.	.947E-2	.7	12	33.	.912E-2	1.1	12	25.	.107E-1	-.3
			-.352E-2	3.8			-.525E-2	3.9			-.285E-2	3.9			-.587E-2	3.3
5	10	56.	263.1	9	10	32.	263.4	20	10	32.	264.4	22	10	22.	262.4	23
	12	56.	.921E-2	1.2	12	33.	.105E-1	.4	12	32.	.790E-2	.1	12	23.	.105E-1	1.0
			-.453E-2	2.5			-.639E-2	2.7			.562E-3	4.5			-.553E-2	3.0
6	10	52.	263.3	13	10	30.	263.4	31	10	32.	264.6	41	10	23.	262.6	36
	12	53.	.857E-2	-.4	12	31.	.102E-1	.5	12	32.	.842E-2	-.5	12	26.	.110E-1	-.4
			-.392E-2	3.7			-.631E-2	3.0			-.228E-2	4.4			-.691E-2	4.4

1.0 MB TEMPERATURE

STATIONS 04202 70192 72913 74124 (HIGH LATITUDES)

PERIOD RUN	72/347 - 73/115	73/116 - 73/288	73/289 - 74/115	74/116 - 74/360
1	6 88. 255.7 81 5 92. .955E+2 0.0 .180E+2 16.0	6 91. 273.3 117 5 91. .867E+2 0.0 .801E+1 9.7	6 80. 252.3 121 5 83. .102E+3 0.0 .115E+2 11.9	6 95. 261.0 173 9 95. .131E+3 0.0 -.280E+2 18.2
2	6 88. 255.3 17 5 93. .917E+2 1.0 .194E+2 5.5	6 89. 274.1 17 5 89. .842E+2 -.3 .842E+1 2.5	6 79. 252.2 17 5 83. .102E+3 -.7 .113E+2 3.3	6 95. 262.0 31 9 95. .128E+3 -.3 -.214E+2 4.7
3	6 87. 256.2 15 5 91. .967E+2 1.1 .188E+2 4.7	6 91. 273.1 17 5 91. .845E+2 2.8 .107E+2 1.9	6 81. 252.4 20 5 85. .102E+3 2.4 .118E+2 4.7	6 95. 260.9 24 9 95. .129E+3 -1.3 -.272E+2 4.9
4	6 88. 255.8 12 5 93. .926E+2 .4 .189E+2 5.3	6 92. 273.4 14 5 92. .857E+2 -.8 .910E+1 3.2	6 79. 252.5 16 5 83. .102E+3 -3.6 .106E+2 3.7	6 95. 261.5 27 9 95. .127E+3 -1.0 -.176E+2 4.1
5	6 89. 255.6 5 5 93. .956E+2 -4.3 .175E+2 6.8	6 92. 272.8 11 5 92. .880E+2 .8 .738E+1 2.8	6 79. 252.3 12 5 84. .995E+2 -1.0 .126E+2 4.3	6 94. 260.9 16 9 95. .130E+3 -.4 -.256E+2 2.9
6	6 86. 255.6 10 5 90. .952E+2 -2.0 .175E+2 3.9	6 91. 273.1 17 5 91. .858E+2 .9 .861E+1 2.3	6 78. 252.7 20 5 82. .983E+2 -.5 .117E+2 4.0	6 94. 260.3 35 9 95. .136E+3 .2 -.365E+2 3.9

STATIONS 72402 72391 72269 74794 (MID LATITUDES)

PERIOD RUN	72/347 - 73/115	73/116 - 73/288	73/289 - 74/115	74/116 - 74/360
1	4 26. 269.6 177 5 28. .416E+2 0.0 .905E+1 6.3	6 30. 268.8 267 5 30. .817E+2 0.0 .522E-1 4.7	6 31. 264.2 309 4 39. .622E+2 0.0 .352E+2 5.9	6 47. 267.1 321 5 49. .870E+2 0.0 .142E+2 5.9
2	4 29. 269.7 26 5 29. .464E+2 .0 .413E+1 6.0	6 31. 269.1 51 5 31. .841E+2 -.2 .826E+0 3.6	6 30. 264.2 54 4 39. .602E+2 .1 .343E+2 4.9	6 40. 267.4 47 5 43. .792E+2 -1.3 .149E+2 4.2
3	4 24. 269.6 26 5 25. .409E+2 -.3 .833E+1 4.6	6 28. 268.8 40 5 28. .785E+2 .2 .243E+1 2.6	6 31. 264.1 44 4 38. .505E+2 .8 .367E+2 4.6	6 49. 267.0 50 5 52. .888E+2 .8 .176E+2 4.3
4	4 27. 269.6 26 5 28. .430E+2 .8 .792E+1 4.6	6 35. 269.1 42 5 36. .747E+2 -1.2 .799E+1 5.1	6 32. 264.1 51 4 40. .634E+2 -.2 .346E+2 4.7	6 47. 266.9 44 5 49. .876E+2 .1 .130E+2 4.2
5	4 27. 269.5 19 5 27. .459E+2 .6 .476E+1 5.0	6 30. 268.7 29 5 31. .867E+2 1.5 -.355E+1 3.7	6 32. 264.3 37 4 40. .651E+2 -.5 .350E+2 4.6	6 46. 267.0 37 5 47. .885E+2 1.1 .107E+2 4.4
6	4 26. 269.4 29 5 28. .395E+2 2.0 .109E+2 4.4	6 27. 268.7 49 5 27. .829E+2 .5 -.444E+1 3.8	6 37. 264.2 45 4 45. .694E+2 1.1 .356E+2 5.1	6 46. 267.2 50 5 49. .863E+2 .1 .130E+2 5.1

STATIONS 91162 78861 78801 91366 61902 (LOW LATITUDES)

PERIOD RUN	72/347 - 73/115	73/116 - 73/288	73/289 - 74/115	74/116 - 74/360
1	6 35. 269.7 116 5 43. .543E+2 0.0 .217E+2 5.6	5 21. 267.9 164 6 24. .250E+2 0.0 .626E+2 4.5	5 14. 270.0 214 6 16. .154E+2 0.0 .452E+2 4.5	6 22. 267.7 224 5 29. .444E+2 0.0 .250E+2 4.0
2	6 37. 269.5 19 5 44. .567E+2 .1 .215E+2 3.4	5 19. 267.9 31 6 24. .226E+2 -.3 .784E+2 2.8	5 16. 269.9 34 6 18. .145E+2 .2 .477E+2 4.3	6 20. 267.7 36 5 28. .404E+2 .2 .260E+2 2.8
3	6 23. 270.2 17 5 34. .343E+2 -2.0 .223E+2 4.8	5 21. 267.9 28 6 24. .226E+2 .9 .681E+2 4.3	5 13. 270.3 35 6 15. .118E+2 -1.5 .486E+2 5.0	6 23. 267.8 39 5 30. .448E+2 -.9 .252E+2 3.2
4	6 37. 269.7 16 5 46. .546E+2 .8 .262E+2 3.7	5 19. 267.9 23 6 22. .226E+2 .4 .585E+2 4.5	5 14. 270.1 30 6 15. .174E+2 -.4 .355E+2 3.9	6 21. 267.7 29 5 27. .418E+2 .2 .243E+2 2.5
5	6 37. 269.7 10 5 46. .543E+2 1.2 .215E+2 5.7	5 23. 267.9 20 6 27. .254E+2 .9 .713E+2 4.1	5 12. 270.0 22 6 14. .137E+2 -.5 .416E+2 4.6	6 19. 267.8 23 5 26. .347E+2 -.3 .252E+2 3.4
6	6 31. 269.9 13 5 38. .524E+2 -.3 .195E+2 4.8	5 21. 267.9 29 6 23. .260E+2 .5 .592E+2 3.1	5 15. 270.0 40 6 20. .113E+2 -.0 .710E+2 4.2	6 23. 267.6 35 5 29. .497E+2 .8 .224E+2 3.5

.4 MB TEMPERATURE

STATIONS 04202 70192 72913 74124 (HIGH LATITUDES)

RUN	PERIOD 72/347 - 73/115	73/116 - 73/288	73/289 - 74/115	74/116 - 74/360
1	4 70. 259.0 77	6 69. 269.2 96	5 39. 259.1 112	6 63. 262.7 155
	6 83. .604E+2 0.0	8 73. .116E+3 0.0	6 44. .251E+2 0.0	7 74. .182E+3 0.0
	.579E+2 15.6	-.619E+2 7.4	.281E+2 10.9	-.117E+3 10.5
2	4 69. 258.5 15	6 70. 269.9 15	5 36. 259.0 15	6 60. 263.3 26
	6 85. .580E+2 1.5	8 74. .125E+3 -.2	6 41. .236E+2 .3	7 75. .187E+3 -.2
	.619E+2 6.5	-.672E+2 3.9	.304E+2 7.0	-.124E+3 7.1
3	4 70. 259.4 15	6 66. 269.0 11	5 36. 259.7 17	6 66. 262.6 22
	6 83. .642E+2 1.6	8 71. .122E+3 1.6	6 42. .222E+2 -2.5	7 75. .167E+3 .3
	.571E+2 6.9	-.709E+2 2.9	.304E+2 8.1	-.102E+3 5.9
4	4 71. 259.7 12	6 77. 269.4 14	5 43. 259.2 14	6 67. 262.3 25
	6 83. .610E+2 -4.0	8 79. .102E+3 -1.5	6 47. .279E+2 -2.3	7 74. .169E+3 1.3
	.556E+2 6.0	-.438E+2 5.6	.235E+2 9.8	-.103E+3 5.2
5	4 70. 258.9 5	6 68. 268.7 4	5 41. 258.7 11	6 63. 262.5 14
	6 84. .608E+2 1.1	8 74. .119E+3 5.8	6 46. .242E+2 3.8	7 73. .176E+3 -1.1
	.581E+2 2.8	-.697E+2 5.3	.279E+2 8.8	-.112E+3 5.4
6	4 71. 259.4 9	6 66. 269.1 12	5 37. 259.3 20	6 61. 262.5 33
	6 84. .636E+2 -1.1	8 72. .127E+3 .9	6 41. .238E+2 1.1	7 77. .210E+3 -.9
	.573E+2 6.8	-.761E+2 2.7	.257E+2 6.5	-.144E+3 6.3

STATIONS 72402 72391 72269 74794 (MID LATITUDES)

RUN	PERIOD 72/347 - 73/115	73/116 - 73/288	73/289 - 74/115	74/116 - 74/360
1	6 8. 260.6 167	4 17. 260.7 238	4 4. 260.5 292	6 9. 258.1 300
	3 9. .465E+2 0.0	6 18. .845E+2 0.0	6 4. .282E+2 0.0	4 14. .391E+2 0.0
	-.198E-2 6.0	.193E+2 5.4	-.815E+1 6.2	.289E+2 5.3
2	6 10. 260.4 24	4 19. 260.9 47	4 4. 260.8 47	6 11. 258.3 42
	3 12. .601E+2 .5	6 20. .948E+2 -.5	6 4. .270E+2 -1.8	4 13. .435E+2 -.6
	-.321E-2 6.3	.213E+2 4.5	-.375E+1 6.6	.194E+2 5.6
3	6 9. 260.6 26	4 19. 260.8 37	4 3. 260.4 38	6 9. 258.0 45
	3 10. .492E+2 -.5	6 20. .921E+2 .5	6 4. .275E+2 .5	4 15. .392E+2 .8
	-.190E-2 6.1	.173E+2 4.3	-.111E+2 6.7	.314E+2 4.4
4	6 7. 260.7 26	4 17. 260.9 40	4 5. 260.3 46	6 10. 258.0 40
	3 8. .444E+2 -.4	6 19. .744E+2 -.5	6 5. .301E+2 1.3	4 15. .412E+2 .7
	-.228E-2 6.1	.272E+2 5.9	-.102E+2 5.5	.312E+2 4.8
5	6 7. 260.6 17	4 18. 260.5 27	4 4. 260.4 32	6 8. 258.1 36
	3 8. .464E+2 .5	6 19. .924E+2 2.1	6 4. .261E+2 .3	4 14. .368E+2 .4
	-.186E-2 4.8	.149E+2 3.3	.169E+1 5.2	.311E+2 6.1
6	6 9. 260.3 29	4 16. 261.0 43	4 5. 260.5 42	6 9. 258.0 48
	3 10. .504E+2 1.5	6 17. .806E+2 -1.4	6 5. .302E+2 .0	4 14. .393E+2 1.2
	-.255E-2 4.1	.172E+2 5.2	-.850E+1 6.7	.293E+2 5.4

STATIONS 91162 78861 78801 91366 61902 (LOW LATITUDES)

RUN	PERIOD 72/347 - 73/115	73/116 - 73/288	73/289 - 74/115	74/116 - 74/360
1	5 5. 264.6 97	5 13. 261.6 142	5 16. 261.4 199	5 20. 260.4 210
	3 6. .930E+1 0.0	4 14. .291E+2 0.0	4 19. .210E+2 0.0	6 21. .520E+2 0.0
	-.169E-2 4.4	.359E+2 5.3	.330E+2 4.9	-.343E+2 5.7
2	5 5. 264.6 17	5 17. 261.6 26	5 16. 261.5 32	5 20. 260.6 34
	3 6. .101E+2 .4	4 20. .349E+2 -.7	4 19. .211E+2 -.8	6 22. .552E+2 -.9
	-.146E-2 3.7	.510E+2 4.5	.353E+2 3.7	-.490E+2 5.4
3	5 5. 264.6 16	5 11. 261.6 25	5 13. 261.5 34	5 24. 260.4 36
	3 5. .101E+2 .6	4 11. .307E+2 .8	4 17. .171E+2 -.2	6 25. .572E+2 -.4
	-.684E-3 3.9	.195E+2 4.3	.403E+2 3.6	-.366E+2 5.4
4	5 6. 264.5 14	5 16. 261.8 20	5 19. 261.4 27	5 20. 260.4 27
	3 8. .115E+2 1.6	4 17. .355E+2 -.9	4 23. .201E+2 -.2	6 21. .520E+2 -.2
	-.262E-2 3.6	.334E+2 4.7	.374E+2 6.3	-.298E+2 4.1
5	5 7. 264.8 7	5 14. 261.7 18	5 14. 261.6 21	5 18. 260.4 22
	3 12. .845E+1 -2.8	4 17. .266E+2 .0	4 16. .213E+2 -1.5	6 19. .532E+2 .2
	-.308E-2 9.4	.570E+2 5.1	.223E+2 5.4	-.433E+2 3.5
6	5 4. 264.6 11	5 11. 261.4 27	5 14. 261.2 40	5 19. 260.7 33
	3 4. .872E+1 .5	4 14. .203E+2 1.4	4 17. .169E+2 1.2	6 19. .506E+2 -1.9
	-.896E-3 2.7	.551E+2 4.4	.413E+2 3.8	-.371E+2 4.8

10.0 TO 5.0 MB MEAN TEMPERATURE

STATIONS 04202 70192 72913 74124 (HIGH LATITUDES)

RUN	PERIOD 72/347 - 73/115	73/116 - 73/288	73/289 - 74/115	74/116 - 74/360
1	8 68. 222.9 83 3 75. .159E+2 0.0 .106E-1 8.8	8 92. 240.0 122 5 93. .779E+2 0.0 .608E+1 7.9	8 88. 225.4 104 12 95. .140E+3 0.0 -.137E-1 10.4	8 95. 233.0 181 4 96. .737E+2 0.0 -.135E+2 14.1
2	8 65. 223.2 17 3 71. .168E+2 -.2 .983E-2 3.1	8 91. 240.4 18 5 92. .793E+2 .3 .571E+1 2.1	8 88. 225.0 15 12 95. .158E+3 .6 -.135E-1 2.5	8 95. 233.3 33 4 96. .737E+2 .3 -.181E+2 2.7
3	8 66. 223.1 16 3 73. .140E+2 .1 .124E-1 3.9	8 91. 239.7 19 5 92. .771E+2 1.1 .691E+1 1.7	8 88. 225.3 18 12 94. .151E+3 -.1 -.121E-1 2.4	8 95. 232.6 27 4 96. .727E+2 -.3 -.186E+2 2.3
4	8 71. 222.9 11 3 76. .248E+2 .6 .922E-2 4.8	8 93. 239.9 15 5 93. .762E+2 .6 .652E+1 2.7	8 88. 225.0 12 12 95. .158E+3 -.4 -.132E-1 2.9	8 95. 233.5 25 4 96. .731E+2 -1.0 -.152E+2 2.4
5	8 69. 222.5 6 3 84. -.156E+2 -1.8 .167E-1 11.8	8 93. 239.7 10 5 93. .793E+2 -.3 .491E+1 3.0	8 87. 225.9 12 12 95. .144E+3 -.6 -.143E-1 2.0	8 95. 232.9 16 4 96. .740E+2 .2 -.131E+2 2.3
6	8 67. 222.6 10 3 74. .144E+2 1.3 .104E-1 4.4	8 92. 239.7 20 5 93. .758E+2 .5 .729E+1 2.0	8 90. 225.4 18 12 95. .149E+3 .8 -.116E-1 2.4	8 95. 232.5 37 4 95. .745E+2 -.2 -.677E+1 2.3

STATIONS 72402 72391 72269 74794 (MID LATITUDES)

RUN	PERIOD 72/347 - 73/115	73/116 - 73/288	73/289 - 74/115	74/116 - 74/360
1	8 69. 236.9 159 12 77. .208E+3 0.0 -.157E-1 8.1	8 52. 239.8 248 7 53. .872E+2 0.0 .659E+1 3.5	8 56. 231.4 300 11 62. .147E+3 0.0 -.605E-2 4.5	8 65. 236.3 308 4 70. .715E+2 0.0 -.319E+2 4.8
2	8 70. 236.7 24 12 78. .212E+3 .3 -.156E-1 3.9	8 51. 239.9 45 7 51. .823E+2 .0 .108E+2 2.1	8 62. 231.2 54 11 67. .137E+3 .4 -.535E-2 3.9	8 65. 236.4 46 4 70. .739E+2 .3 -.325E+2 2.6
3	8 69. 237.3 22 12 76. .201E+3 -1.3 -.149E-1 4.1	8 51. 239.8 37 7 51. .913E+2 -.7 .156E+1 1.7	8 51. 231.3 43 11 57. .143E+3 -.3 -.579E-2 2.5	8 65. 236.3 49 4 70. .708E+2 .3 -.329E+2 2.8
4	8 68. 236.7 24 12 77. .217E+3 1.2 -.169E-1 3.3	8 50. 239.9 36 7 50. .818E+2 -.7 .853E+1 2.0	8 61. 231.3 52 11 68. .149E+3 .2 -.611E-2 3.7	8 66. 236.3 44 4 70. .744E+2 -.8 -.265E+2 2.7
5	8 68. 237.2 18 12 77. .212E+3 -.2 -.166E-1 4.0	8 54. 239.8 28 7 54. .932E+2 -.1 .257E+1 2.6	8 58. 231.4 37 11 65. .148E+3 .4 -.671E-2 4.0	8 66. 236.2 35 4 71. .721E+2 .6 -.319E+2 2.8
6	8 67. 237.0 28 12 77. .215E+3 -.6 -.175E-1 3.6	8 53. 239.7 47 7 54. .810E+2 .0 .115E+2 2.6	8 54. 231.3 46 11 60. .146E+3 .1 -.611E-2 2.3	8 65. 236.4 46 4 70. .693E+2 -.5 -.324E+2 2.7

STATIONS 91162 78861 78801 91366 61902 (LOW LATITUDES)

RUN	PERIOD 72/347 - 73/115	73/116 - 73/288	73/289 - 74/115	74/116 - 74/360
1	8 52. 238.6 117 4 54. .819E+2 0.0 -.175E+2 4.5	8 34. 239.5 167 4 35. .121E+3 0.0 .149E+2 3.4	8 38. 234.5 216 4 38. .108E+3 0.0 -.125E+2 4.4	8 23. 239.1 216 4 26. .609E+2 0.0 -.283E+2 3.4
2	8 51. 238.4 21 4 54. .829E+2 -.1 -.203E+2 3.0	8 32. 239.4 30 4 33. .115E+3 .4 .167E+2 2.9	8 41. 234.2 36 4 42. .104E+3 1.1 -.108E+2 4.1	8 24. 239.0 38 4 26. .601E+2 .2 -.269E+2 2.9
3	8 53. 238.6 17 4 54. .856E+2 .7 -.136E+2 2.8	8 41. 239.4 28 4 41. .123E+3 .0 .655E+1 3.8	8 37. 234.7 37 4 38. .107E+3 -1.3 -.141E+2 3.0	8 19. 239.0 35 4 23. .504E+2 -.2 -.322E+2 2.9
4	8 50. 238.2 17 4 53. .786E+2 1.1 -.201E+2 3.4	8 33. 239.4 25 4 34. .121E+3 .2 .186E+2 2.2	8 41. 234.3 32 4 43. .104E+3 1.1 -.209E+2 4.4	8 22. 239.1 30 4 25. .600E+2 -.2 -.291E+2 2.6
5	8 51. 238.8 9 4 54. .846E+2 -.2 -.176E+2 2.5	8 29. 239.5 19 4 30. .112E+3 -.4 .115E+2 2.6	8 42. 234.4 20 4 43. .106E+3 -.2 -.147E+2 4.7	8 22. 239.0 22 4 26. .542E+2 -.0 -.343E+2 3.1
6	8 48. 238.8 12 4 51. .768E+2 .7 -.215E+2 2.9	8 32. 239.5 29 4 33. .119E+3 -.2 .185E+2 2.9	8 36. 234.5 39 4 37. .105E+3 -.1 -.147E+2 3.6	8 27. 239.0 32 4 29. .669E+2 -.1 -.225E+2 3.7

5.0 TO 2.0 MB MEAN TEMPERATURE

STATIONS 04202 70192 72913 74124 (HIGH LATITUDES)

PERIOD	72/347 - 73/115				73/116 - 73/288				73/289 - 74/115				74/116 - 74/360			
RUN																
1	13	80.	235.3	83	8	92.	255.6	121	13	88.	233.1	120	7	97.	244.5	181
	5	83.	.110E-1	0.0	5	95.	.880E+2	0.0	7	91.	.246E-2	0.0	5	97.	.976E+2	0.0
			.720E+1	11.6			.230E+2	10.1			.728E+2	11.5			.767E+1	17.4
2	13	77.	235.5	15	8	90.	256.4	18	13	88.	232.9	17	7	97.	245.1	33
	5	81.	.108E-1	-.1	5	93.	.890E+2	-.4	7	91.	.298E-2	-.5	5	97.	.966E+2	.7
			.723E+1	2.9			.224E+2	2.0			.720E+2	2.7			.120E+2	3.3
3	13	80.	235.9	14	8	91.	255.4	19	13	89.	233.1	19	7	97.	244.1	27
	5	81.	.108E-1	.1	5	94.	.863E+2	1.0	7	92.	.288E-2	.5	5	97.	.993E+2	-.4
			.427E+1	5.3			.239E+2	1.8			.749E+2	3.8			.521E+1	2.9
4	13	80.	235.5	12	8	93.	255.5	15	13	87.	233.0	15	7	97.	245.1	26
	5	84.	.108E-1	.5	5	96.	.846E+2	.5	7	90.	.281E-2	.4	5	97.	.101E+3	-.8
			.940E+1	5.5			.251E+2	3.9			.758E+2	2.9			.135E+1	3.0
5	13	86.	234.9	6	8	93.	255.3	10	13	88.	233.3	12	7	97.	244.2	16
	5	89.	.114E-1	-1.7	5	95.	.890E+2	-.1	7	91.	.282E-2	-.2	5	97.	.102E+3	.3
			.614E+1	11.0			.223E+2	3.7			.757E+2	3.0			.137E+1	2.7
6	13	79.	234.7	10	8	92.	255.2	19	13	89.	233.1	19	7	97.	244.1	36
	5	82.	.110E-1	1.8	5	95.	.855E+2	.9	7	92.	.289E-2	-1.3	5	97.	.974E+2	-.5
			.632E+1	5.8			.246E+2	2.0			.765E+2	4.1			.826E+1	2.2

STATIONS 72402 72391 72269 74794 (MID LATITUDES)

PERIOD	72/347 - 73/115				73/116 - 73/288				73/289 - 74/115				74/116 - 74/360			
RUN																
1	13	58.	252.3	168	13	62.	254.4	265	13	67.	248.1	310	13	69.	251.9	316
	5	70.	.811E-2	0.0	5	62.	.926E-2	0.0	7	70.	.510E-3	0.0	5	70.	.770E-2	0.0
			.236E+2	7.7			-.276E+1	4.2			.114E+3	6.5			.785E+1	5.5
2	13	56.	252.2	25	13	61.	254.6	51	13	69.	247.8	57	13	68.	252.1	46
	5	70.	.802E-2	-.5	5	61.	.865E-2	.1	7	73.	-.302E-3	1.0	5	69.	.749E-2	-.7
			.243E+2	4.6			.321E+1	2.4			.122E+3	4.4			.611E+1	3.6
3	13	60.	252.4	23	13	61.	254.4	40	13	65.	248.2	45	13	69.	251.9	50
	5	70.	.840E-2	.8	5	61.	.964E-2	-.6	7	69.	.407E-3	-.6	5	70.	.791E-2	.4
			.233E+2	4.5			-.350E+1	1.7			.114E+3	3.3			.901E+1	2.6
4	13	58.	252.5	25	13	61.	254.5	40	13	70.	248.0	53	13	68.	251.8	45
	5	71.	.824E-2	-.1	5	61.	.885E-2	-.5	7	73.	.142E-2	.4	5	69.	.771E-2	-.0
			.244E+2	4.2			.682E+0	2.5			.104E+3	4.5			.942E+1	2.5
5	13	58.	252.6	19	13	62.	254.3	28	13	70.	248.0	38	13	73.	251.9	36
	5	67.	.788E-2	.1	5	63.	.976E-2	.7	7	73.	.147E-2	1.2	5	73.	.797E-2	.7
			.199E+2	4.8			-.730E+1	2.6			.102E+3	5.3			.548E+1	4.0
6	13	58.	252.3	28	13	61.	254.3	49	13	67.	248.2	46	13	72.	252.0	48
	5	72.	.825E-2	1.0	5	61.	.921E-2	-.2	7	71.	-.816E-4	-.1	5	72.	.770E-2	-.3
			.257E+2	3.7			-.421E+1	2.4			.120E+3	3.7			.708E+1	3.9

STATIONS 91162 78861 78801 91366 61902 (LOW LATITUDES)

PERIOD	72/347 - 73/115				73/116 - 73/288				73/289 - 74/115				74/116 - 74/360			
RUN																
1	13	57.	254.7	118	13	30.	255.1	172	13	39.	255.9	221	13	29.	254.8	226
	5	61.	.706E-2	0.0	5	46.	.560E-2	0.0	12	39.	.107E-1	0.0	12	34.	.120E-1	0.0
			.976E+1	4.7			.328E+2	3.8			-.196E-2	4.8			-.910E-2	3.5
2	13	56.	254.6	19	13	34.	254.9	32	13	42.	255.6	35	13	28.	254.7	37
	5	60.	.68[illegible]-2	-.9	5	48.	.622E-2	.3	12	43.	.125E-1	1.0	12	32.	.116E-1	.2
			.915E+1	3.0			.298E+2	3.2			-.574E-2	4.1			-.841E-2	2.2
3	13	58.	254.8	17	13	33.	255.6	29	13	40.	256.1	38	13	23.	254.8	39
	5	63.	.751E-2	1.0	5	48.	.577E-2	.8	12	40.	.975E-2	-1.0	12	29.	.116E-1	-.4
			.123E+2	3.0			.314E+2	3.3			.584E-3	4.0			-.102E-1	2.5
4	13	54.	25[illegible].5	17	13	30.	255.0	26	13	42.	255.8	32	13	30.	254.8	30
	5	57.	.659E-2	.4	5	47.	.533E-2	-.2	12	42.	.118E-1	1.3	12	36.	.127E-1	-.3
			.888E+1	3.2			.333E+2	3.0			-.475E-2	4.7			-.101E-1	2.5
5	13	57.	254.8	9	13	27.	255.1	20	13	42.	256.0	22	13	28.	254.7	23
	5	61.	.719E-2	.9	5	43.	.535E-2	-.1	12	42.	.102E-1	-.9	12	32.	.114E-1	.3
			.969E+1	2.8			.336E+2	2.0			-.417E-3	5.3			-.862E-2	3.1
6	13	57.	254.9	13	13	31.	255.1	31	13	41.	256.2	41	13	30.	254.8	36
	5	60.	.720E-2	.3	5	46.	.621E-2	-.2	12	41.	.972E-2	-1.4	12	35.	.115E-1	-.2
			.894E+1	3.3			.309E+2	2.5			-.404E-4	4.7			-.870E-2	3.5

2.0 TO 1.0 MB MEAN TEMPERATURE

STATIONS 04202 70192 72913 74124 (HIGH LATITUDES)

RUN	72/347 - 73/115				73/116 - 73/288				73/289 - 74/115				74/116 - 74/360			
1	6	89.	249.5	78	6	93.	270.1	116	6	88.	245.9	121	6	96.	256.5	172
	5	90.	.106E+3	0.0	7	93.	.633E+2	0.0	5	88.	.118E+3	0.0	7	96.	.106E+3	0.0
			.831E+1	15.3			.425E+2	10.4			.281E+1	12.1			.190E+2	19.5
2	6	88.	249.6	15	6	91.	270.9	17	6	88.	245.7	17	6	97.	257.5	31
	5	89.	.105E+3	-.8	7	92.	.683E+2	-.1	5	88.	.117E+3	.8	7	97.	.107E+3	-.1
			.840E+1	2.7			.351E+2	2.1			.444E+1	3.9			.187E+2	4.2
3	6	89.	250.4	13	6	92.	270.0	17	6	89.	246.1	20	6	97.	256.3	24
	5	90.	.108E+3	-.5	7	92.	.636E+2	1.1	5	89.	.119E+3	2.0	7	97.	.105E+3	-1.1
			.840E+1	5.0			.414E+2	1.7			.265E+1	4.0			.181E+2	4.4
4	6	89.	249.8	12	6	92.	270.0	14	6	89.	246.0	16	6	96.	257.0	27
	5	91.	.992E+2	-1.0	7	93.	.612E+2	-.0	5	89.	.121E+3	-2.0	7	96.	.978E+2	-.2
			.121E+2	5.9			.444E+2	1.9			.176E+1	4.7			.258E+2	3.2
5	6	92.	249.4	5	6	94.	269.8	10	6	88.	246.1	12	6	96.	256.3	16
	5	92.	.106E+3	-5.2	7	95.	.639E+2	-.4	5	89.	.116E+3	-2.2	7	96.	.998E+2	1.1
			.735E+1	9.0			.437E+2	4.4			.399E+1	3.5			.242E+2	2.7
6	6	89.	249.1	10	6	[illegible]	269.8	17	6	88.	246.3	20	6	96.	255.9	35
	5	90.	.108E+3	.3	7	93.	.732E+2	.4	5	88.	.115E+3	-.3	7	96.	.102E+3	-.5
			.697E+1	5.9			.324E+2	2.3			.348E+1	4.2			.236E+2	3.5

STATIONS 72402 72391 72269 74794 (MID LATITUDES)

RUN	72/347 - 73/115				73/116 - 73/288				73/289 - 74/115				74/116 - 74/360			
1	5	39.	267.3	176	6	45.	267.5	267	6	58.	263.5	308	6	60.	265.0	321
	6	43.	.282E+2	0.0	7	46.	.762E+2	0.0	5	61.	.777E+2	0.0	7	62.	.892E+2	0.0
			.374E+2	6.7			.223E+2	4.4			.166E+2	6.3			.361E+2	6.6
2	5	35.	267.3	26	6	43.	267.8	51	6	58.	263.5	54	6	56.	265.4	47
	6	37.	.281E+2	-.8	7	43.	.801E+2	-.6	5	60.	.806E+2	-.1	7	57.	.837E+2	-1.5
			.314E+2	3.4			.166E+2	2.6			.144E+2	4.1			.337E+2	4.4
3	5	34.	267.3	26	6	44.	267.5	40	6	59.	263.5	44	6	61.	265.0	50
	6	39.	.254E+2	-.5	7	44.	.770E+2	-.4	5	62.	.690E+2	.7	7	62.	.908E+2	.3
			.414E+2	3.7			.221E+2	2.3			.205E+2	4.7			.367E+2	3.8
4	5	39.	267.4	26	6	46.	267.7	42	6	60.	263.5	51	6	60.	264.8	44
	6	43.	.279E+2	.5	7	46.	.840E+2	-1.2	5	63.	.773E+2	-.5	7	62.	.882E+2	.3
			.393E+2	4.4			.141E+2	2.8			.174E+2	4.5			.395E+2	3.7
5	5	34.	267.4	19	6	45.	267.4	29	6	59.	263.5	37	6	60.	265.0	37
	6	37.	.277E+2	.6	7	46.	.685E+2	1.1	5	61.	.797E+2	.2	7	62.	.821E+2	1.1
			.288E+2	4.6			.307E+2	3.1			.170E+2	4.4			.411E+2	4.9
6	5	40.	267.1	29	6	46.	267.3	49	6	61.	263.5	45	6	59.	265.1	50
	6	44.	.279E+2	1.5	7	46.	.783E+2	.4	5	64.	.806E+2	.8	7	60.	.938E+2	-.1
			.409E+2	3.5			.172E+2	3.8			.175E+2	4.1			.297E+2	4.2

STATIONS 91162 78861 78801 91366 61902 (LOW LATITUDES)

RUN	72/347 - 73/115				73/116 - 73/288				73/289 - 74/115				74/116 - 74/360			
1	6	60.	268.1	115	6	35.	267.4	163	6	27.	268.8	214	6	25.	266.9	224
	3	62.	.117E+3	0.0	12	41.	.196E+3	0.0	5	28.	.832E+2	0.0	5	27.	.705E+2	0.0
			-.394E-2	4.9			-.121E-1	3.8			.696E+1	4.0			.131E+2	3.8
2	6	59.	267.6	19	6	36.	267.4	31	6	28.	268.7	34	6	23.	266.8	36
	3	63.	.119E+3	1.1	12	41.	.202E+3	-.0	5	29.	.841E+2	-.1	5	25.	.638E+2	.4
			-.503E-2	2.7			-.120E-1	2.6			.922E+1	2.6			.135E+2	3.4
3	6	53.	268.4	17	6	39.	267.4	28	6	28.	269.0	35	6	23.	267.0	39
	3	56.	.107E+3	.0	12	44.	.195E+3	.8	5	28.	.915E+2	-1.3	5	25.	.681E+2	-1.2
			-.338E-2	3.4			-.109E-1	3.5			-.241E+0	4.7			.120E+2	2.9
4	6	61.	267.9	16	6	36.	267.3	23	6	26.	268.8	30	6	25.	266.8	29
	3	65.	.123E+3	1.4	12	42.	.190E+3	.7	5	26.	.844E+2	.3	5	26.	.736E+2	.1
			-.494E-2	3.3			-.116E-1	3.4			.691E+1	2.4			.111E+2	2.8
5	6	61.	268.1	9	6	40.	267.3	20	6	26.	268.9	22	6	23.	266.8	23
	3	64.	.119E+3	1.4	12	46.	.208E+3	1.2	5	26.	.833E+2	-.8	5	25.	.641E+2	-.0
			-.413E-2	3.2			-.125E-1	3.3			.392E+1	4.6			.133E+2	3.6
6	6	56.	268.3	13	6	36.	267.3	29	6	31.	268.8	40	6	21.	266.9	35
	3	58.	.108E+3	.4	12	42.	.194E+3	.8	5	31.	.982E+2	-.1	5	23.	.610E+2	-.9
			-.307E-2	3.9			-.118E-1	2.8			.454E+1	3.6			.130E+2	3.2

1.0 TO .4 MB MEAN TEMPERATURE

STATIONS 04202 70192 72913 74124 (HIGH LATITUDES)

RUN \ PERIOD	72/347 - 73/115	73/116 - 73/208	73/209 - 74/115	74/116 - 74/360
1	5 81. 257.1 75 6 93. .286E+2 0.0 .640E+2 14.8	6 91. 271.8 95 5 92. .641E+2 0.0 .146E+2 8.2	6 56. 254.8 112 5 70. .642E+2 0.0 .187E+2 10.5	6 89. 262.0 154 7 92. .172E+3 0.0 -.778E+2 13.9
2	5 80. 256.8 15 6 92. .268E+2 1.3 .669E+2 4.0	6 89. 272.8 15 5 90. .660E+2 -.7 .133E+2 2.3	6 56. 254.6 15 5 69. .677E+2 -.7 .178E+2 5.0	6 89. 262.7 26 7 93. .174E+3 .0 -.822E+2 5.7
3	5 81. 257.5 15 6 93. .300E+2 2.3 .644E+2 5.2	6 90. 271.5 11 5 92. .625E+2 1.6 .160E+2 2.5	6 59. 254.3 17 5 70. .644E+2 -.7 .145E+2 5.0	6 90. 262.1 21 7 92. .158E+3 -1.4 -.661E+2 3.9
4	5 83. 257.4 12 6 94. .305E+2 -1.6 .599E+2 5.5	6 92. 271.9 13 5 93. .645E+2 -1.2 .147E+2 2.8	6 55. 256.1 14 5 71. .636E+2 -2.7 .208E+2 5.8	6 91. 261.8 25 7 92. .157E+3 .6 -.625E+2 4.6
5	5 81. 256.9 5 6 94. .276E+2 -1.6 .657E+2 5.3	6 90. 271.4 4 5 91. .618E+2 2.5 .151E+2 3.0	6 58. 254.7 11 5 72. .656E+2 1.7 .190E+2 5.5	6 90. 261.7 14 7 92. .159E+3 -.3 -.667E+2 4.0
6	5 81. 257.3 9 6 91. .298E+2 -2.6 .622E+2 4.2	6 90. 271.7 12 5 92. .606E+2 .9 .165E+2 2.7	6 56. 254.3 20 5 69. .637E+2 -.2 .173E+2 5.6	6 88. 261.4 33 7 92. .194E+3 -.1 -.987E+2 4.1

STATIONS 72402 72391 72269 74794 (MID LATITUDES)

RUN \ PERIOD	72/347 - 73/115	73/116 - 73/208	73/209 - 74/115	74/116 - 74/360
1	4 15. 266.2 167 5 17. .224E+2 0.0 .850E+1 5.2	5 18. 265.6 236 6 22. .170E+2 0.0 .459E+2 4.4	4 19. 264.7 291 6 29. .324E+2 0.0 .330E+2 4.5	5 16. 264.1 300 6 39. .103E+2 0.0 .592E+2 4.5
2	4 17. 266.2 24 5 18. .248E+2 .3 .697E+1 4.6	5 18. 265.7 47 6 21. .196E+2 .2 .437E+2 2.9	4 20. 265.0 47 6 31. .316E+2 -1.3 .348E+2 4.7	5 13. 264.4 42 6 37. .845E+1 -1.3 .595E+2 4.2
3	4 13. 266.2 26 5 15. .199E+2 -.2 .881E+1 4.9	5 19. 265.6 37 6 21. .227E+2 -.2 .370E+2 3.2	4 20. 264.7 38 6 29. .346E+2 1.8 .315E+2 3.9	5 20. 264.1 45 6 42. .131E+2 1.1 .596E+2 3.4
4	4 19. 266.2 26 5 19. .293E+2 .2 .490E+1 4.9	5 20. 265.7 40 6 24. .179E+2 -.1 .460E+2 3.9	4 19. 264.6 45 6 28. .374E+2 .2 .317E+2 3.5	5 15. 264.0 40 6 38. .939E+1 .1 .604E+2 3.4
5	4 14. 266.1 17 5 16. .235E+2 .5 .696E+1 3.8	5 19. 265.5 27 6 23. .149E+2 1.1 .511E+2 3.8	4 19. 264.8 32 6 29. .315E+2 -.2 .367E+2 3.1	5 14. 264.2 36 6 36. .945E+1 .2 .583E+2 3.8
6	4 15. 266.0 29 5 19. .204E+2 1.6 .114E+2 3.9	5 15. 265.6 43 6 19. .114E+2 -.2 .463E+2 4.4	4 23. 264.7 42 6 35. .345E+2 .9 .365E+2 4.8	5 15. 264.2 48 6 36. .112E+2 .2 .559E+2 3.9

STATIONS 91162 78861 78801 91366 61902 (LOW LATITUDES)

RUN \ PERIOD	72/347 - 73/115	73/116 - 73/208	73/209 - 74/115	74/116 - 74/360
1	5 32. 268.4 97 6 39. .152E+2 0.0 .350E+2 4.0	5 28. 266.0 142 4 28. .374E+2 0.0 .159E+2 3.9	5 18. 267.4 197 4 19. .210E+2 0.0 .160E+2 3.[illegible]	5 32. 265.6 210 4 33. .489E+2 0.0 -.272E+2 4.3
2	5 35. 268.4 17 6 43. .157E+2 -.5 .394E+2 2.4	5 28. 265.9 26 4 30. .378E+2 -.2 .265E+2 3.8	5 19. 267.3 32 4 21. .214E+2 .2 .203E+2 3.3	5 34. 265.6 34 4 35. .503E+2 .2 -.258E+2 3.4
3	5 28. 268.8 16 6 32. .154E+2 -1.4 .236E+2 3.3	5 24. 266.1 25 4 24. .352E+2 -.1 .346E+1 3.9	5 15. 267.4 34 4 14. .169E+2 .1 .169E+2 3.3	5 37. 265.6 36 4 38. .505E+2 -.6 -.182E+2 3.9
4	5 37. 268.4 14 6 43. .198E+2 .8 .336E+2 2.8	5 30. 266.1 20 4 31. .423E+2 -.5 .113E+2 2.8	5 22. 267.5 21 4 24. .219E+2 -.7 .159E+2 5.1	5 30. 265.6 27 4 32. .491E+2 .4 -.303E+2 2.4
5	5 35. 268.5 7 6 43. .154E+2 .7 .351E+2 4.0	5 29. 266.1 18 4 32. .350E+2 -.6 .359E+2 3.6	5 15. 267.5 20 4 16. .187E+2 -.8 .169E+2 3.2	5 29. 265.6 22 4 31. .467E+2 .3 -.253E+2 2.8
6	5 29. 268.6 11 6 37. .161E+2 .3 .382E+2 3.4	5 25. 266.0 27 4 26. .328E+2 -.1 .263E+2 2.6	5 16. 267.3 39 4 18. .169E+2 .5 .210E+2 2.6	5 31. 265.8 33 4 33. .493E+2 -1.0 -.322E+2 3.3

10.0 MB TEMPERATURE

STATIONS 04202 70192 72913 74124 (HIGH LATITUDES)

PERIOD / RUN	72/347 - 73/115	73/116 - 73/288	73/289 - 74/115	74/116 - 74/360
1	3 61. 221.1 68	3 88. 234.7 0	3 86. 223.3 0	3 90. 229.6 0
	2 75. .148E-2 0.0	8 89. .440E-2 0.0	4 89. .915E-2 0.0	4 92. .786E-2 0.0
	.106E+1 7.3	.349E+2 6.9	-.212E+2 10.6	-.220E+2 9.7
2	3 60. 221.2 13	3 88. 235.0 18	3 86. 222.8 16	3 90. 229.8 33
	2 75. .126E-2 -.3	8 89. .338E-2 1.0	4 89. .842E-2 1.0	4 93. .779E-2 .3
	.109E+1 2.8	.439E+2 2.4	-.237E+2 3.9	-.246E+2 3.0
3	3 60. 220.8 14	3 87. 234.4 19	3 86. 223.2 18	3 90. 229.3 27
	2 74. .184E-2 .1	8 88. .294E-2 1.1	4 89. .917E-2 -.1	4 93. .767E-2 -.5
	.987E+0 3.2	.465E+2 1.7	-.208E+2 3.2	-.257E+2 2.5
4	3 62. 220.8 8	3 88. 234.7 15	3 86. 223.0 13	3 90. 230.0 25
	2 75. .223E-2 2.1	8 89. .455E-2 .1	4 89. .916E-2 -.5	4 93. .780E-2 -1.0
	.990E+0 1.6	.335E+2 2.1	-.226E+2 2.7	-.221E+2 2.2
5	3 68. 220.8 6	3 91. 234.4 11	3 86. 223.7 12	3 90. 229.5 16
	2 85. .155E-2 -2.3	8 91. .743E-2 -.9	4 88. .908E-2 -1.0	4 92. .793E-2 .0
	.115E+1 8.5	.126E+2 3.9	-.213E+2 3.0	-.209E+2 2.5
6	3 57. 221.1 9	3 88. 234.5 20	3 88. 223.1 18	3 89. 229.2 37
	2 73. .863E-3 -.2	8 89. .337E-2 .1	4 89. .993E-2 .8	4 91. .794E-2 -.7
	.104E+1 4.3	.413E+2 2.2	-.173E+2 2.9	-.169E+2 2.5

STATIONS 72402 72391 72269 74794 (MID LATITUDES)

PERIOD / RUN	72/347 - 73/115	73/116 - 73/288	73/289 - 74/115	74/116 - 74/360
1	2 79. 230.8 138	8 38. 234.4 0	2 55. 229.4 293	3 66. 230.8 0
	8 81. .995E+0 0.0	3 38. .893E+2 0.0	3 57. .704E+0 0.0	4 72. .916E-2 0.0
	.302E+2 7.8	-.233E-2 3.2	.274E-2 4.0	-.345E+2 4.9
2	2 79. 230.6 19	8 34. 234.6 45	2 59. 229.4 54	3 69. 230.7 46
	8 82. .100E+1 .2	3 34. .906E+2 -.1	3 61. .684E+0 -.1	4 74. .950E-2 .8
	.303E+2 3.1	-.307E-2 1.9	.296E-2 3.2	-.333E+2 3.2
3	2 80. 231.2 20	8 37. 234.4 37	2 52. 229.4 42	3 67. 230.7 49
	8 82. .977E+0 -1.0	3 37. .589E+2 -.2	3 53. .698E+0 -.0	4 72. .924E-2 .4
	.306E+2 3.6	.173E-2 2.3	.203E-2 3.1	-.335E+2 2.5
4	2 80. 230.6 21	8 35. 234.6 36	2 60. 229.2 51	3 66. 230.8 44
	8 82. .105E+1 .4	3 36. .102E+3 -.9	3 62. .669E+0 1.0	4 71. .935E-2 -.6
	.283E+2 3.7	-.458E-2 1.9	.344E-2 3.2	-.321E+2 2.1
5	2 78. 231.1 16	8 41. 234.5 28	2 57. 229.4 37	3 67. 230.7 35
	8 80. .980E+0 -.3	3 41. .671E+2 -.5	3 58. .711E+0 .7	4 73. .907E-2 .2
	.299E+2 2.8	-.181E-2 3.2	.260E-2 3.1	-.374E+2 2.7
6	2 78. 230.9 24	8 40. 234.3 47	2 56. 229.4 44	3 65. 230.6 46
	8 79. .103E+1 -1.3	3 40. .727E+2 .4	3 58. .687E+0 -.2	4 71. .885E-2 -.4
	.215E+2 2.2	-.493E-3 3.1	.276E-2 2.7	-.350E+2 2.1

STATIONS 91162 78861 78801 91366 61902 (LOW LATITUDES)

PERIOD / RUN	72/347 - 73/115	73/116 - 73/288	73/289 - 74/115	74/116 - 74/360
1	3 54. 232.7 0	8 36. 233.4 0	3 32. 233.0 0	3 19. 233.3 0
	8 55. .167E-1 0.0	3 38. .586E+2 0.0	4 33. .111E-1 0.0	4 20. .774E-2 0.0
	-.371E+2 4.3	.783E-2 3.1	-.147E+2 3.5	-.254E+2 3.5
2	3 51. 232.4 21	8 36. 233.3 30	3 31. 232.9 36	3 19. 233.3 39
	8 52. .180E-1 -.0	3 39. .471E+2 .5	4 33. .100E-1 .1	4 20. .738E-2 -.3
	-.511E+2 3.0	.935E-2 2.7	-.192E+2 3.2	-.225E+2 3.6
3	3 55. 232.6 17	8 38. 233.3 29	3 34. 233.1 37	3 17. 233.3 35
	8 55. .154E-1 .5	3 41. .494E+2 .4	4 34. .120E-1 -.8	4 19. .719E-2 -.3
	-.267E+2 3.1	.965E-2 3.0	-.129E+2 2.7	-.297E+2 2.5
4	3 55. 232.4 17	8 36. 233.5 25	3 33. 232.9 34	3 17. 233.3 30
	8 57. .196E-1 -.1	3 38. .559E+2 -.2	4 35. .106E-1 .8	4 19. .777E-2 -.4
	-.561E+2 3.6	.813E-2 2.1	-.169E+2 3.4	-.236E+2 2.5
5	3 55. 232.8 9	8 32. 233.4 19	3 34. 233.0 20	3 18. 233.2 22
	8 56. .173E-1 -.7	3 35. .518E+2 -.0	4 35. .111E-1 -.1	4 20. .687E-2 -.2
	-.385E+2 2.8	.888E-2 1.9	-.187E+2 3.2	-.333E+2 2.6
6	3 51. 232.8 13	8 34. 233.4 29	3 30. 233.1 39	3 21. 233.2 32
	8 51. .165E-1 .8	3 36. .596E+2 -.4	4 31. .103E-1 -.6	4 22. .829E-2 .3
	-.380E+2 2.1	.742E-2 2.5	-.178E+2 3.1	-.233E+2 3.4

10.0 TO 5.0 MB MEAN TEMPERATURE

STATIONS 04202 70192 72913 74124 (HIGH LATITUDES)

RUN	72/347 - 73/115	73/116 - 73/288	73/289 - 74/115	74/116 - 74/360
1	8 64. 224.5 68	8 92. 240.0 0	8 88. 225.4 0	8 95. 233.0 181
	2 75. .422E+2 0.0	5 93. .779E+2 0.0	12 95. .160E+3 0.0	2 97. .463E+2 0.0
	.713E+0 8.0	.608E+1 7.9	-.137E-1 10.4	.585E+0 17.1
2	8 62. 224.7 13	8 91. 240.4 18	8 85. 225.0 15	8 95. 233.3 33
	2 72. .440E+2 -.7	5 92. .793E+2 .3	12 95. .158E+3 .6	2 97. .465E+2 .5
	.632E+0 2.9	.571E+1 2.1	-.135E-1 2.5	.581E+0 2.1
3	8 62. 224.7 14	8 91. 239.7 19	8 88. 225.3 18	8 95. 232.6 27
	2 74. .389E+2 -.5	5 92. .771E+2 1.1	12 94. .151E+3 -.1	2 96. .456E+2 -.4
	.743E+0 3.4	.691E+1 1.7	-.121E-1 2.4	.595E+0 1.7
4	8 63. 224.3 8	8 93. 239.9 15	8 88. 225.0 12	8 95. 233.5 25
	2 74. .434E+2 1.7	5 93. .762E+2 .6	12 95. .158E+3 -.4	2 97. .497E+2 -.5
	.688E+0 2.0	.652E+1 2.7	-.132E-1 2.9	.534E+0 2.2
5	8 66. 224.2 6	8 93. 239.7 10	8 87. 225.9 12	8 95. 232.9 16
	2 82. .374E+2 -2.5	5 93. .793E+2 -.3	12 95. .164E+3 -.6	2 97. .463E+2 .1
	.873E+0 9.0	.491E+1 3.0	-.143E-1 2.0	.595E+0 2.2
6	8 62. 224.4 9	8 92. 239.7 20	8 90. 225.4 18	8 95. 232.5 37
	2 74. .392E+2 .4	5 93. .758E+2 .5	12 95. .149E+3 .8	2 96. .452E+2 -.5
	.706E+0 4.5	.729E+1 2.0	-.116E-1 2.4	.606E+0 1.9

STATIONS 72402 72391 72269 74794 (MID LATITUDES)

RUN	72/347 - 73/115	73/116 - 73/288	73/289 - 74/115	74/116 - 74/360
1	8 69. 236.9 0	8 52. 239.8 0	8 56. 233.4 0	8 65. 236.3 0
	12 77. .208E+1 0.0	7 53. .872E+2 0.0	11 62. .147E+3 0.0	4 70. .715E+2 0.0
	-.157E-1 8.1	.659E+1 3.5	-.605E-2 4.5	-.319E+2 4.8
2	8 70. 236.7 24	8 51. 239.9 45	8 62. 233.2 54	8 65. 236.4 46
	12 78. .212E+3 .3	7 51. .823E+2 .0	11 67. .137E+3 .4	4 70. .739E+2 .3
	-.156E-1 3.9	.108E+2 2.1	-.535E-2 3.9	-.325E+2 2.6
3	8 69. 237.3 22	8 51. 239.8 37	8 51. 233.3 43	8 65. 236.3 49
	12 76. .201E+3 -1.3	7 51. .713E+2 -.7	11 57. .143E+3 -.3	4 70. .706E+2 .3
	-.149E-1 4.1	.156E+1 1.7	-.579E-2 2.5	-.329E+2 2.8
4	8 66. 236.7 24	8 50. 239.9 36	8 61. 233.3 52	8 66. 236.3 44
	12 77. .217E+3 1.2	7 50. .618E+2 -.7	11 68. .149E+3 .2	4 70. .744E+2 -.8
	-.169E-1 3.3	.853E+1 2.0	-.611E-2 3.7	-.265E+2 2.7
5	8 68. 237.2 18	8 54. 239.8 28	8 58. 233.4 37	8 66. 236.2 35
	12 77. .212E+3 -.2	7 54. .932E+2 -.1	11 65. .149E+3 .4	4 71. .722E+2 .6
	-.166E-1 4.0	.257E+1 2.6	-.621E-2 4.0	-.319E+2 2.8
6	9 67. 237.0 28	8 53. 239.7 47	8 54. 233.3 46	8 65. 236.4 46
	12 77. .215E+3 -.6	7 54. .810E+2 .0	11 60. .146E+3 .1	4 70. .693E+2 -.5
	-.175E-1 3.6	.115E+2 2.6	-.611E-2 2.3	-.324E+2 2.7

STATIONS 91162 78861 78801 91366 61902 (LOW LATITUDES)

RUN	72/347 - 73/115	73/116 - 73/288	73/289 - 74/115	74/116 - 74/360
1	8 52. 238.6 0	8 34. 239.5 0	8 38. 238.5 0	8 23. 239.1 0
	4 54. .819E+2 0.0	4 35. .121E+3 0.0	4 38. .108E+3 0.0	4 26. .609E+2 0.0
	-.175E+2 4.5	.149E+2 3.4	-.125E+2 4.4	-.283E+2 3.4
2	8 51. 238.4 21	8 32. 239.4 30	8 41. 238.2 36	8 24. 239.0 38
	4 54. .829E+2 -.1	4 33. .115E+3 .4	4 42. .104E+3 1.1	4 26. .601E+2 .2
	-.203E+2 3.0	.167E+2 2.9	-.188E+2 4.1	-.269E+2 2.9
3	8 53. 238.6 17	8 41. 239.4 28	8 37. 238.7 37	8 19. 239.0 35
	4 54. .856E+2 .7	4 41. .123E+3 .0	4 38. .107E+3 -1.3	4 23. .504E+2 -.2
	-.136E+2 2.8	.655E+1 3.8	-.161E+2 3.0	-.322E+2 2.9
4	8 50. 238.2 17	8 33. 239.4 25	8 41. 238.3 32	8 22. 239.1 30
	4 53. .766E+2 1.1	4 34. .121E+3 .2	4 43. .104E+3 1.1	4 25. .603E+2 -.2
	-.201E+2 3.4	.186E+2 2.2	-.209E+2 4.4	-.291E+2 2.6
5	8 51. 238.8 9	8 29. 239.5 19	8 42. 238.4 20	8 22. 239.0 22
	4 54. .846E+2 -.2	4 30. .112E+3 -.4	4 43. .108E+3 -.2	4 26. .542E+2 -.0
	-.176E+2 2.5	.115E+2 2.6	-.187E+2 4.7	-.343E+2 3.1
6	8 48. 238.8 12	8 32. 239.5 29	8 36. 238.5 39	8 27. 239.0 32
	4 51. .768E+2 .7	4 33. .119E+3 -.2	4 37. .105E+3 -.1	4 29. .669E+2 -.1
	-.215E+2 2.9	.185E+2 2.9	-.147E+2 3.6	-.225E+2 3.7

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The purpose of this first phase of a study on the morphology of planetary waves was to estimate global temperatures for the upper stratosphere and lower mesosphere from the radiances of the SCR-B experiment on Nimbus 5. This has been successfully achieved using a regression of the radiances on meteorological rocket data. In general, the accuracy of the retrieved temperatures, i.e. standard deviation of the error, varies from about $3^{o}K$ at 10 mb to about $5.5^{o}K$ at 0.4 mb as compared to meteorological rocket values. Layer mean temperatures are about one-half degree more accurate than temperatures

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(Block 20 continued) at the bordering levels. Details of the procedure, which included extensive prior preparation of the radiances, are given here. Global temperatures at 10, 5, 2, 1 and 0.4 mb along the orbit, and the mean temperatures (thicknesses) between the levels, are now ready to apply to the next phase of this study, which will obtain heights of those surfaces at latitude-longitude gridpoints. The planetary waves will be computed from these gridpoint values.